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# The IRON AGE



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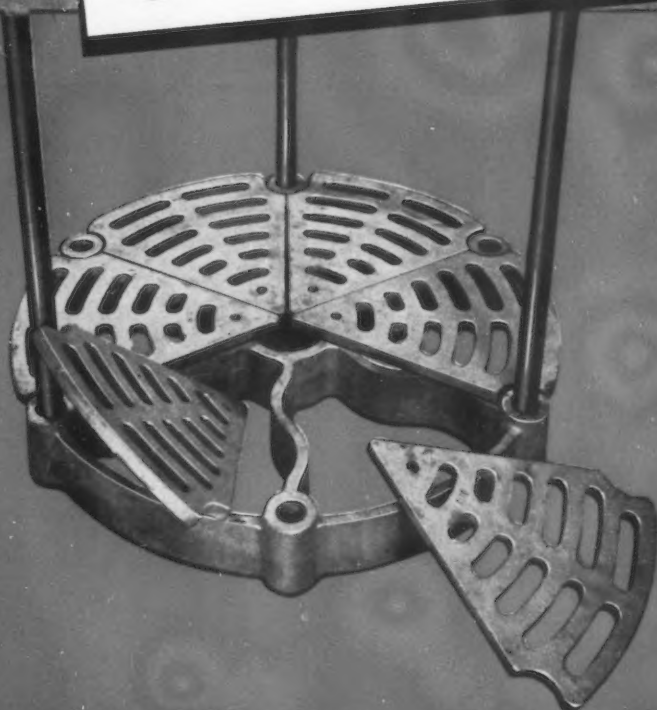
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# This Week in The IRON AGE

Vol. 151, No. 24

June 17, 1943

## Editorial

Four Freedoms Versus 130 Million Freedoms . . . . . 45

## Technical Articles

25 Per Cent Speed Increase by New Drilling Technique . . . . .	48
Hot Trimming of Shell Forgings . . . . .	51
Automatic Heat Treating in a Jobbing Forge Shop . . . . .	52
Douglas Tube and Bender Speeds Output . . . . .	54
Plastics and Soap Combined in Water-Base Points . . . . .	57
Design of Aluminum Forgings . . . . .	58
Inspection History Stamped on Part . . . . .	63
Tear Drop Tanks . . . . .	64
Additional Notes on the Cold Treatment of Metals . . . . .	66
Steel, Plastics and Zinc Used in Combination Die Set . . . . .	68
Replaceable Section Arbor . . . . .	70
Spinning High Explosive Bomb Casings . . . . .	71
New Equipment Machine Tools . . . . .	72

## Features

News Front . . . . .	47
Assembly Line . . . . .	76
Washington . . . . .	80
West Coast . . . . .	84
Fatigue Cracks . . . . .	88
Dear Editor . . . . .	90

## News and Markets

Still More Steel Needed, Washington Says . . . . .	95
Industry Recognizes Production Problems . . . . .	97
Numerous Factors Retarding Expansion . . . . .	97
Farm Equipment Program Given Steel . . . . .	99
More Boats Needed For Ore Service . . . . .	99
Plates Dictate Availability of Steel . . . . .	100
Raw Materials Consumption Shows Rise . . . . .	101
Record of CMP Regulations . . . . .	105
How By-Product Producer Operates . . . . .	122
News Briefly Told . . . . .	138
Personals and Obituaries . . . . .	160
Machine Tool News . . . . .	162
Non-Ferrous Metals News and Developments . . . . .	164
Non-Ferrous Metals Prices; Scrap Prices . . . . .	165
Iron and Steel Scrap News and Prices . . . . .	166
Comparison of Prices, by Year . . . . .	168
Finished Iron and Steel Prices . . . . .	169
NE Steel and Warehouse Prices . . . . .	170
Stainless Steel, Tool Steel Prices . . . . .	171
Semi-Finished Iron and Steel Prices . . . . .	171
Pig Iron Prices . . . . .	174
Ore and Coke Prices . . . . .	175
Ferroalloy Prices . . . . .	176

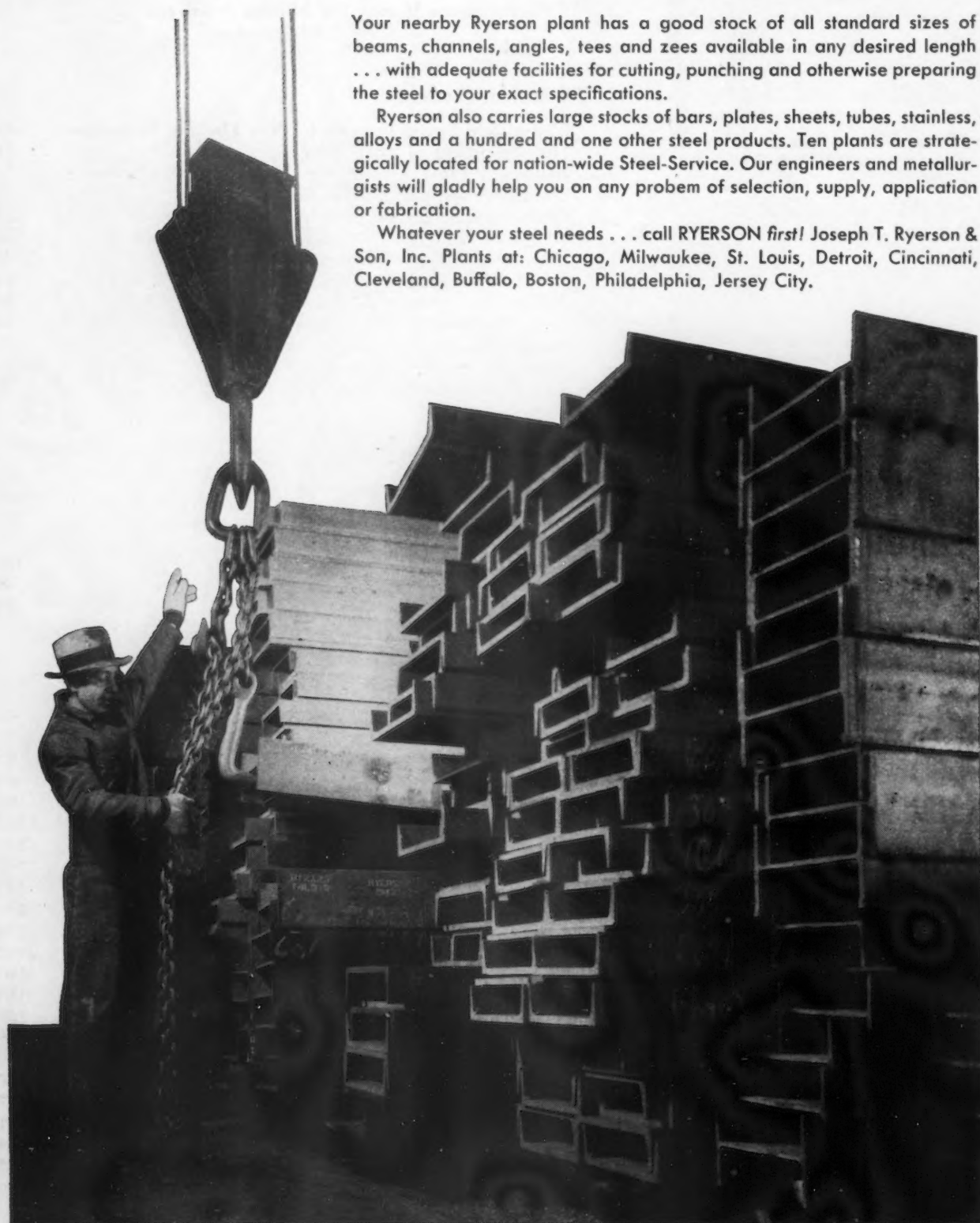
Index to Advertisers . . . . . 243

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## Four Freedoms Versus 130 Million Freedoms

SINCE so many people and so many organizations are exhibiting blueprints for our post-war world, I wonder if it is not now appropriate to hear from the little man who wears a barrel.

You remember the character in the Johnstone cartoons, who might be said to be a successor of Diogenes who first made the barrel famous. Diogenes was perhaps somewhat better off than his modern successor for he merely lived in a barrel in the intervals between his search for an honest man, whereas our little friend has to wear one.

I wonder what this little man, this forgotten man, thinks about when contemplating the platform of the four freedoms. Freedom from want, freedom from fear, freedom of speech, and religious freedom. Probably he would say that he agreed with them in principle but that he would like to see them brought down to earth so that he, as the forgotten man, might feel their beneficial impact.

Perhaps he might cite his own personal experience in trying to get a job of work that would pay an honest day's pay for an honest day's work. The job that he tried to get but didn't was that of a construction helper on a government cantonment project. Strangely enough, when he applied for his job he found that while Uncle Sam was ostensibly the employer and paymaster, the right to hire had been farmed out to a private organization that exacted an initiation fee, so to speak, amounting to approximately \$60 for the right to work. Not having the sixty dollars, although badly wanting the job, our little man could not take advantage of the "freedom from want" clause in the four freedoms.

He wrote to his nephew about this, a lad who was a member of the United Mine Workers' Union. "How lucky you are," he said, "to belong to the union and thus have the right to work." But the nephew wrote back that he was not working as much as he would like to because Mr. John L. Lewis did not want him to work. "I would like very much to work and thus do my part in helping to win the war," said the nephew, "but I am afraid that if I did I would get my head broken." So the little man in the barrel discovered that the second freedom, freedom from fear, was more or less of a myth also.

"Well," said the modern Diogenes, "there is still freedom of speech left and I will exercise it." So when a policeman came along and objected to his appearing in public in such bizarre raiment, he told the officer to go and peddle his papers elsewhere. And thus ended, suddenly, the third illusion of freedom.

Not being particularly religious, our little man had had enough and so did not attempt to test out his right to the fourth freedom. Three times and out were enough.

The moral of this, I think, is that if we are going to plan on freedom, we should divide it not into four but into 130 million equal parts.

*J. H. Van Deventer*



# Preview of Bombs for Berlin

One shipment of Inland plates—20 carloads—  
outbound for a manufacturer of aerial bombs

Thousands of tons of Inland plates for aerial bombs is only one example of the many ways Inland's entire output of steel is being used to help conquer America's foes.

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Allied Mediterranean successes have encouraged the stepping up of plans for the Continental assault. To support this acceleration will require at least 1,000,000 tons of steel above visible supply in the third quarter alone, even more in fourth quarter.

Belief that the war is already won is resulting in too much fancy post-war planning and relaxation of pressure on the part of management, infecting labor with a similar lessening of urgency. This attitude will have to change or Washington officials believe that serious impairment of the war effort in 1944 will result.

Aircraft and shipyard labor trouble on the West Coast is expected by employers and union leaders within 60 days unless cost of living stabilization is more positive and WLB authority unqualified.

Three new Canadian molybdenum deposits look very good on paper. At least one has been offered to Jesse Jones for financing.

Current Reynolds Tobacco Co. advertisements label the rocket plane as "sensational new weapon for victory in the air." The only known flying model is one Italian machine described in German aviation periodicals, which also describe an Italian "muscle plane". The muscle force is transmitted to movable wings and an airscrew. The propellor is actuated by a spring, wound up before the flight, which operates at 1500 r.p.m. After starting, the switch-over to "bicycle" muscle power takes place. The plane's test flight was at a height of 5 to 35 ft. above the ground.

A new British ruling reduces cleaning of castings to a minimum and prohibits improvement of surface appearance by welding or filling. Naturally they are called "austerity castings."

Coking coal mines are undergoing considerable mechanization, potential advantages of which cannot be realized without supplementary coal washing. The Appalachian region is putting in 20,000 tons (per 7-hr. shift) of coal washing facilities, with 22,000 additional tons in prospect; Alabama region 4500 tons; the West, 7500 tons, with 8000 additional tons projected.

Plastic canteens are being used by many soldiers in this country. At embarkation ports, however, these canteens are replaced by the conventional metal type. A strictly post-war consumer item is plastic screen cloth, although plastic coated wire cloth may be even more popular as rats find the straight plastic rather tasty.

Alloy borings and turnings, now flooding back to steel mills, show the following analysis distribution, in descending order of importance (tonnage): plain carbon steel, X1314, 4100, 4000, 4300, NE 8600, NE 8700, Nitralloy, 4600. Segregation at the source is still more talk than actuality, the result being considerable loss in alloy utilization and many off-heats.

Ordnance officials have been shown a sensational new drilling technique improvement which increases cutting speeds 25 per cent, gives a better hole finish and tolerance and can be used by unskilled help.

The Army glider program is swooping up, with award of two large contracts last week, one for \$31 million to Ford for cargo gliders, the other, half as large, to Gibson Refrigerator for troop carriers.

Stainless steel analyses modifications have been numerous since the war started. However, the only type likely to extend far beyond the war is the 17 chromium-4 nickel-4 manganese grade, which is about equivalent to 18-8 for applications in train and aircraft construction, and slightly less expensive.

Double-talk, vintage of April, 1941: "Suppose we had an air force that we could send to Europe. Where could it operate? Some of our squadrons might be based in the British Isles; but it is physically impossible to base enough aircraft in the British Isles alone to equal in strength the aircraft that can be based on the continent of Europe." That was Lindbergh speaking.

Recent Berlin photographs of Hitler with commanders on the Russian front show that Hitler still seems to be in command of the Wehrmacht. Particularly interesting, however, is the fact that all officers shown belonged, before the war, to the "pro-Russians" among the German generals, whose spokesman was the present Generaloberst Ruoff, chief of staff of the von Manstein Army Group. Field Marshal von Richthofen, who had succeeded Generaloberst Lohr of the Fourth Air Fleet, has always been impressed by the Russian armed forces.



## 25 Per Cent Speed Increase by

## New

**... A new drill press attachment which permits notable increases in drilling speed and provides improved hole finish and tolerance and longer tool life is described herein. This device provides automatic axial reciprocation of the drill and produces small, uniform chips and is unusually effective in "sticky" metals.**

**I**NCREASES in drilling speeds of up to 25 per cent over handbook ratings, improved hole finish and tolerance and greater safety to the press operator are among the improvements in drilling operations reported by users of a new drilling attachment developed by Bastian-Blessing Co., of Chicago.

The attachment, called the Rego Karweit Driller, is only slightly larger than a chuck and may be fitted to any type drill press and is applicable to

both automatic and sensitive feeds. The driller is indicated by the arrow in Fig. 1.

Possibly the best method of illustrating some of the characteristics of drilling operations when using this device as compared with conventional drilling methods would be to relate the experience of a demonstration held recently for ordnance officials.

A piece of stainless steel was mounted in a vise on the drill. The

feed was set at 0.004 and the speed at 1800 r.p.m. The drill size was  $\frac{1}{4}$  in.

As the drill bit into the steel, the observers backed away, to keep clear of the long, hot whipping chips and splashing of lubricant commonly associated with drilling such steel.

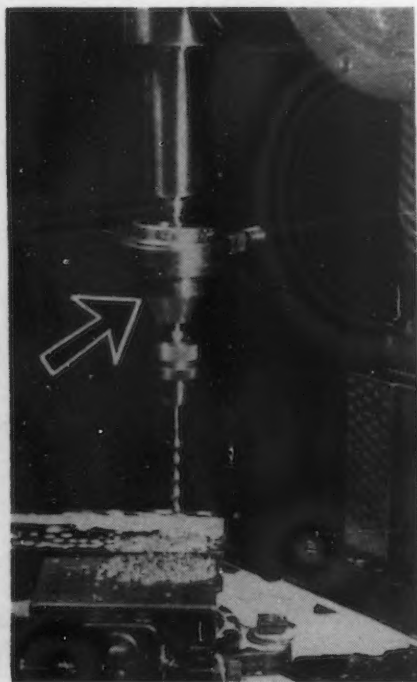
But, as the drill flutes slowly disappeared into the steel, there were no long whipping chips and no splashing, instead a steady stream of small chips bubbled out of the drill flutes and were gently carried away by the coolant.

The first hole went down to 12 diameters before the drill was withdrawn. One observer, an ordnance official, approached the drill to determine how hot it was. After some cautious experimenting, he found he could comfortably grasp the drill in his hand without being burnt. It was just slightly warm.

Another hole was drilled, this time to 20 diameters at the same feed and speed, and with the same small chips, the same cool drill, and the same lack of large chips and of splashing, smoking lubricant. Then followed other equally startling demonstrations in aluminum, magnesium and sticky copper and other materials.

This demonstration, which has been repeated many times under practical operating conditions, highlights some of the unusual characteristics of this driller.

Taking one at a time the questions which naturally arise from such a demonstration, the unusual performance of the drill is primarily the result of a reciprocating action which the Rego Karweit driller superimposes on the drill feed. This action is not noticeable to the eye when the press is operating but may be felt if the hand is placed on the driller. The housing of the driller, as shown in Fig. 1 and 3, does not revolve with the spindle. It is stationary. The rod to the right of the driller in the photographs serves to keep the driller casing from revolving. This method of locking the casing was used for the demonstrations, but other means of achieving this end are being used in



ABOVE

**FIG. 1**—Closeup of the new Rego Karweit driller (arrow). The outer housing of the unit does not revolve.

o o o

BELOW

**FIG. 2**—Small uniform chips resulting from the use of this new drilling device are shown in this illustration. Material being drilled is SAE 1020 steel.





# Drilling Technique

By W. A. PHAIR  
Western Editor, THE IRON AGE

production setups and built into units.

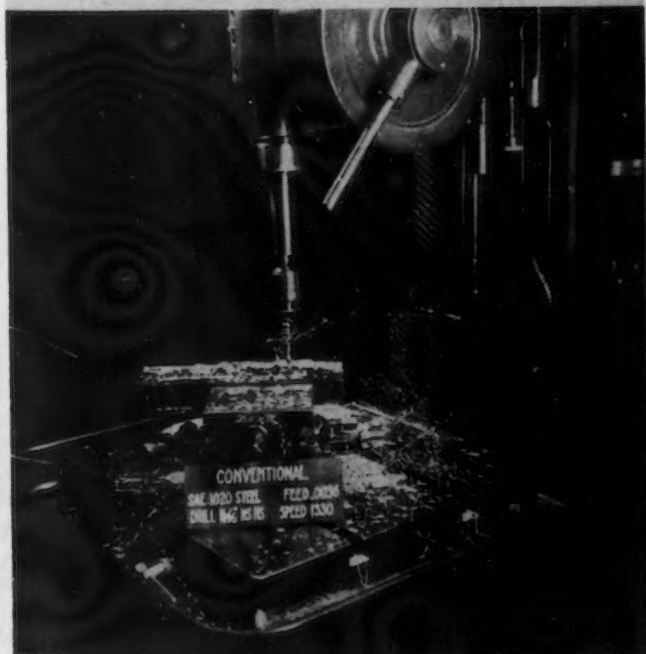
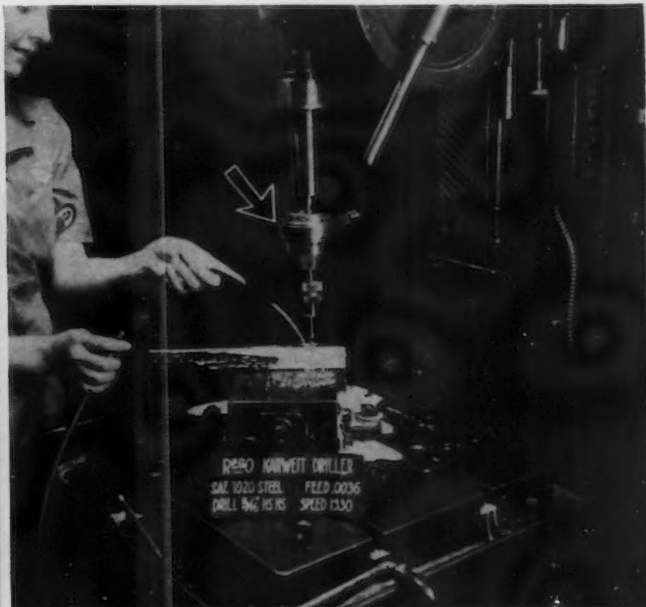
This reciprocating movement of the drill is the result of the interruption of the drilling feed once each revolu-

tion by the mechanism in the driller.

During this interruption, which is entirely automatic, the cutting edge of the drill is lifted slightly from con-

tact with the bottom of the hole, the amount of this retraction being only a very small fraction of an inch. This motion cuts the chips free from the

FIG. 3—A comparison of drilling operations with and without the Rego Karweit driller. Photos to the left show operation without this attachment. Note the chip formation and splattered drill press. Photos on right show same operation but with the drilling attachment. Note how quietly the lubricant lies and the absence of stringy, twirling chips.



work and permits the lubricant to flow under the cutting edges to cool and lubricate them repeatedly throughout the drilling cycle.

The chips produced by this driller are of substantially uniform size and shape for a given drill size, regardless of the material being drilled. The size of the chips are regulated so as to be small enough to clear the drill flutes easily, yet large enough and curled sufficiently that they will not pack in the flutes. The type of chip resulting from drilling a 1020 steel is shown in Fig. 2.

The recurring lifting of the drill, accomplished entirely by a mechanism built into the driller, sets up a vibratory condition whereby the chips are kept in constant agitation. This maintains a looseness beneficial to the chips clearing themselves easily through the flutes or being washed out by the flow of the lubricant.

With the chips moving freely and loosely in the flutes, there is no binding and scoring of the side walls. And by thus eliminating the "feel of the feed" unskilled labor may operate the press with little danger of drill breakage. It is a matter of record that use of the drilling attachment has made it possible to employ automatic feeds where previously only sensitive feeds were feasible.

Fig. 3 illustrates the most notable visible difference in drilling with and without the Rego Karweit driller—the chip formation. The two photos to the right show the attachment in operation (arrow) while the two photos on the left are without the driller. The material, as the placard indicates, is an SAE 1020 steel, the drill size being 5/16 HS, the feed 0.0036 and the speed 1330 r.p.m. The photos were taken at various stages of each cut and show the comparison between long chips resulting from the usual drilling procedure and the small chips resulted from the use of the Karweit driller.

The fact that the coolant is given an opportunity to bathe the cutting edges once each revolution probably accounts in a large measure for the cooler tool performance and consequently longer tool life reported by users of the attachment.

In many installations to date it has been found that the wall finish is improved to the point that the hole can be drilled to size without reaming. This condition has been reported on several jobs, including parts of materials such as SAE 4140.

The Rego Karweit Driller can be used with any conventional drill press, along with standard drills sharpened in the conventional manner. It will

be noted that in the photographs a high spiral drill was used. It has been found that this type drill works a little better than the regular style, although the regular type is acceptable. The driller is equipped with a tapered shank and a tang and is merely inserted in the spindle as would be a drill chuck. Use of this new device requires no changes in coolant practice.

It is desirable that the drill press should be sturdy and sufficiently rigid that any spring between the head and table under operating conditions does not exceed the feed distance of the drill per revolution when the drill head and bed are subjected to the feed pressure expected to be used with the drill.

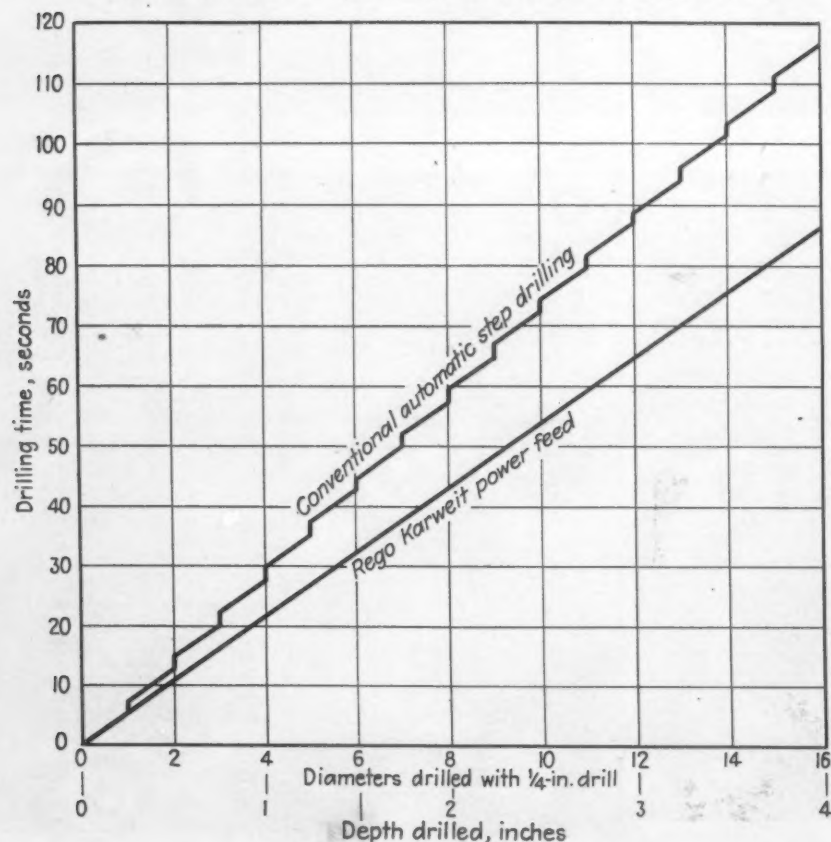
Generally speaking, the drilling time on a particular hole, especially a deep hole, is reduced under otherwise identical conditions since the conventional repeated withdrawal of the drill, including step drilling, to clear the flutes is eliminated. With the Rego Karweit driller it is possible to drill holes in one pass to the extent permitted by the length of the flutes. The only action of the operator is to continuously feed the drill.

An example of the performance of the Rego Karweit driller, as reported by Bastion-Blessing, is given in Fig. 4 in which the performance of the driller is compared with the time of a standard step driller in drilling a 1/4-in. hole in a chrome-molybdenum forging material having a Brinell of 224. The feed rate in both cases was 0.004 and the speed 917 r.p.m. The step driller, as the chart indicates, took 116 sec. while the Rego Karweit driller required 86 sec., a reduction of 30 sec. or about 25 per cent.

The second graph, Fig. 5, shows the relationship in time saved by using the Karweit driller, with proper feed, on deep hole drilling of aluminum where manual feed would be used under normal practice. The short vertical lines of the "manual feed" line are representative of the time lost by pulling the drill out to clear the flutes.

On the question of drill life, hole size and alignment, the following data, based on a three months' run, with a production setup, is illuminating. The tolerances on this job were  $-0.000 + 0.003$ , in SAE 1020 steel, using a No. 25 drill going to a depth of 1 1/2 in. The reject rate originally was 10 per cent. When the Rego Karweit driller was placed in operation, under otherwise identical conditions, the percentage of rejects was cut to 0.5 per cent, production was increased from 200 to 300 pieces per 8-hr. shift

FIG. 4—Comparison in drilling time between a conventional automatic feed setup and automatic feed with the Rego Karweit attachment. The material was a chrome-moly steel of 224 Brinell. Speed and feed were identical in both cases.



and drill breakage practically disappeared.

Citing other experience with this new driller, a user found that in drilling a steel crankshaft with a Brinell hardness of 341 and using No. 30 drills, the drills had to be resharpened approximately every seven holes with conventional drilling procedure, whereas when using the Rego Karweit driller, 30 holes could be drilled before resharpening was necessary. Power feed was used in both cases and speed and feed rates were identical.

In another instance, involving the drilling of a 9/16 in. hole in SAE 4140, a three-spindle press having two Rego drillers was substituted for six turret lathes and gave the same production with improved results. The spotting, pointed drill drilling and reaming performed on the lathes was eliminated. Standard heavy web high spiral drills in the drill press were successfully substituted for oil flute drills previously used in the lathes.

Hand book tables for cutting speeds and feeds still apply, although experience has shown that cutting speed ratings can be safely increased 25 per cent above the hand book ratings.

The elimination of the long chips removes an obvious safety hazard and

adds to the adaptability of unskilled help to drilling jobs. Too, the gener-

ation of small chips, simplifies collection and segregation of the borings.

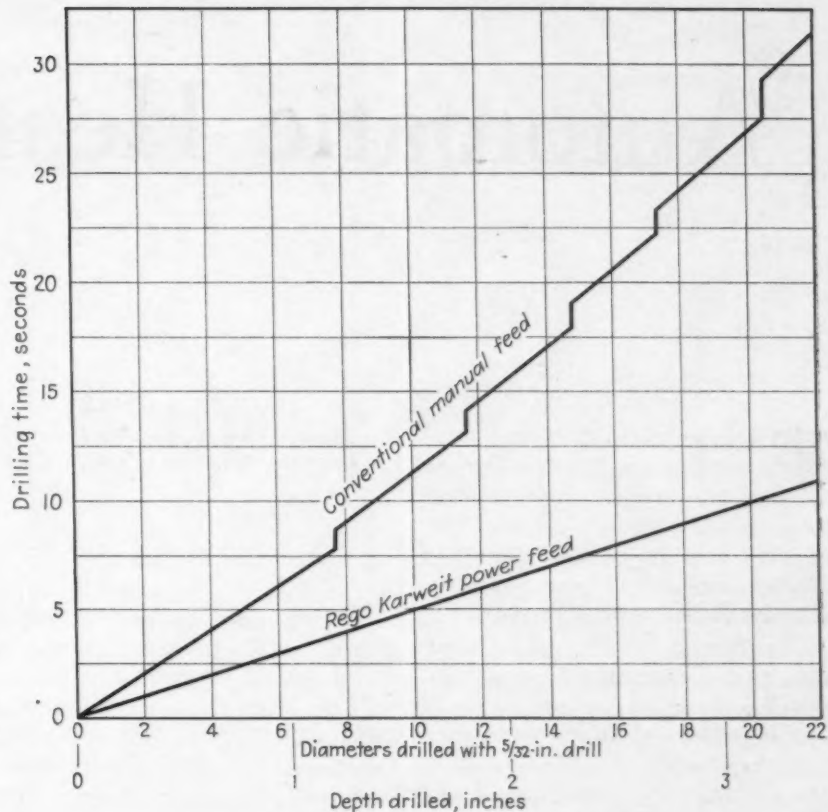


Fig. 5—A comparison of drilling times on aluminum.

## Hot Trimming of Shell Forgings

BY trimming the crop end of the shell forging while it is still hot at the forge plant, the shell trimmer shown saves the cost of shipping the extra weight of the end cut off, the cold-sawing or cutting off operation usually done by the machining contractor and considerable scrap handling. It is obvious that the forge plant has one more operation to perform, but the saving to the machinist is so great that this arrangement is warranted.

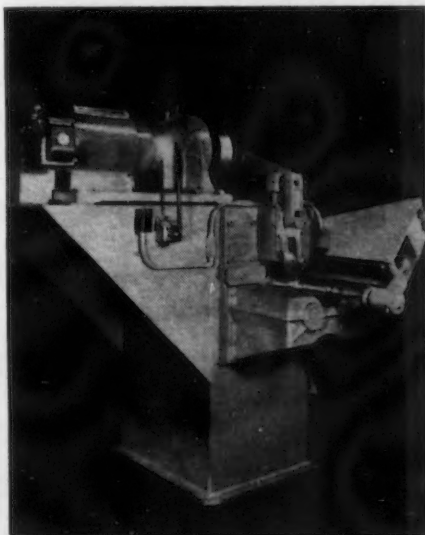
The machine is set in the forge line immediately following the final sizing operation. By means of a simple adjustment, shell forgings ranging in size from the 60-mm. trench mortars through the 155-mm. high explosive shells can be cropped. A production of 270 cuts per hr. on the 105-mm. shell can be realized. Since the bottom of the shell forging cavity is held firmly against the end of the gaging mandrel during the cutting operation, the length can be held to close tolerances so that no

subsequent facing operation is necessary in the machining line.

The machine is nearly automatic in operation, the hot forging being slid from a conveyor over the mandrel. When the start button is depressed, an air operated arm swings into position and holds the shell against the mandrel which locates it from the bottom of the cavity. While held in this position, the forging is rotated by the two driven trunnion rolls that support it. The disk type cutter is now fed automatically through the forging wall. A roll located on the mandrel prevents the formation of an internal burr.

On completion of the cut, the operator ejects the forging along with the cropped end by actuating an air operated ejector, and the cycle is repeated. Cutter life is unusually good so that continuity of operation can be maintained.

This shell trimmer was developed by the Yoder Co., Cleveland, in collaboration with the Bradford Mfg. Co., Bradford, Pa., which makes shell forgings.





# Automatic Heat Treating

By R. R. LaPELLE

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THE provision of continuous automatic heat treating, for use in the average jobbing forge shop, is difficult, due to the wide variety of products which must be handled, and the varying nature of the heat-treating cycles involved.

The General Drop Forge Co., Buffalo, finding that its volume of heat-treating work was increasing at a rate impossible to handle in existing batch type equipment, made a study of available furnace equipment and set up the following requirements:

The equipment must preferably be of the continuous type for compactness, uniformity of treatment, and economy of fuel consumption; it must operate with a minimum of labor, so all handling from the hardening furnace to the receiving tote boxes, must be automatic; the temperatures of hardening and drawing must be subject to independent control; the quenching temperature and time must be under adjustable and automatic control, and both the time in the hardening furnace, and the time in the draw furnace, must be independently variable; the equipment must be so designed that the hardening furnace can be operated independently as an annealing or normalizing furnace, while the draw furnace is operated independently and simultaneously as a stress relieving or draw furnace; and the equipment must be designed to handle a wide variety of products, ranging from small knuckle or shock absorber arms, weighing only one lb. to large parts weighing 45 to 50 lb.

A general view of the equipment which was installed to meet these specifications is shown in Fig. 1. It consists essentially of a pusher type hardening furnace, a conveyor type quench unit, with oil cooler and oil circulating system, and a conveyor type draw furnace.

Pusher type equipment was selected for the hardening furnace because of the heavy loads involved, and the high maximum temperatures required (1800 deg. F.). The trays are loaded by the furnace operator on the small charging table shown at the front end of the furnace, and pushed into and through the furnace by a chain type pusher with receding head. The trays are supported within the furnace chamber on alloy roller rails which extend the entire length of the heating chamber.

At the discharge end of the heating chamber, the trays pass onto a tipping platform. The platform is equipped with fingers for holding the tray in position during the dumping operation, and operated by a pneumatic cylinder, controlled by an electrically operated solenoid valve, which is in turn operated by a limit switch when the tray is properly positioned on the tipping platform. As the tray reaches this position, it depresses a limit switch arm, causing the small door in the side of the furnace opposite the discharge position to open by a pneumatic cylinder. When this door is in the up position, the tipper platform elevates, thereby sliding the work off of the tray and down the chute into the quench tank. The door then closes, and the tipper platform, with the tray still in place, lowers to its original position. When the next push takes place, the empty tray which has been retained in the tipper platform, is pushed ahead onto a sloping discharge conveyor, which delivers it outside the rear door of the furnace. From this point the furnace operator picks the tray up by

means of an overhead monorail hoist, and returns it to the charging end of the furnace to be reloaded.

The furnace is of the underfired type with low pressure gas burners staggered along both sides of the furnace, firing into combustion chambers below the alloy rails comprising the furnace hearth. These combustion chambers are covered by spanner tile spaced to prevent any flame from entering the furnace chamber, while still permitting passage of the hot products of combustion.

The furnace heating cycle is controlled by a time clock, which may be adjusted to heating times ranging from 20 min. to 5 hr. When it is desired to use the furnace for straight annealing or normalizing, the tipping mechanism may be cut out of the cycle, and the work and trays discharged automatically onto the discharge table, instead of through the chute into the quench tank.

For temperature control, the furnace is divided into two automatically controlled zones plus a discharge vestibule section which includes the tipping mechanism. The first zone serves primarily to bring the work and trays from room temperature up to the working temperature as rapidly as possible. The second zone is intended as a soaking section, to insure penetration of the heat throughout heavy sections, and to permit time for the metallurgical changes to take place within the material. The third section, to insure that the material does not cool on the tipping table prior to being quenched, is provided with a fairly high ratio of heat liberation to compensate for the losses about the two discharge doors.

The quench tank is equipped with wooden bumper bars, which take the bump when a 50 lb. forging comes down the chute, and allow the forging

# g in a Jobbing Forge Shop

to settle onto the conveyor with less of a blow.

The quenching medium usually used is oil, which in turn is cooled by a water cooled heat exchanger. The quenching temperature is controlled automatically by a thermostat in the oil line, which actuates a valve in the water line to the heat exchanger. The oil is pumped through manifolds with openings at the point where the work enters the oil.

Work of this sort, direct from the forging hammers, may be expected to shed considerable scale in the quench tank. To take care of this accumulation, access doors have been provided near the bottom of the tank, under the conveyor.

When it is desired to use water as a quenching medium, instead of oil, the pump may be used to withdraw

the oil from the tank. The motion of the quench tank conveyor is intermittent, and is controlled by a separate time clock.

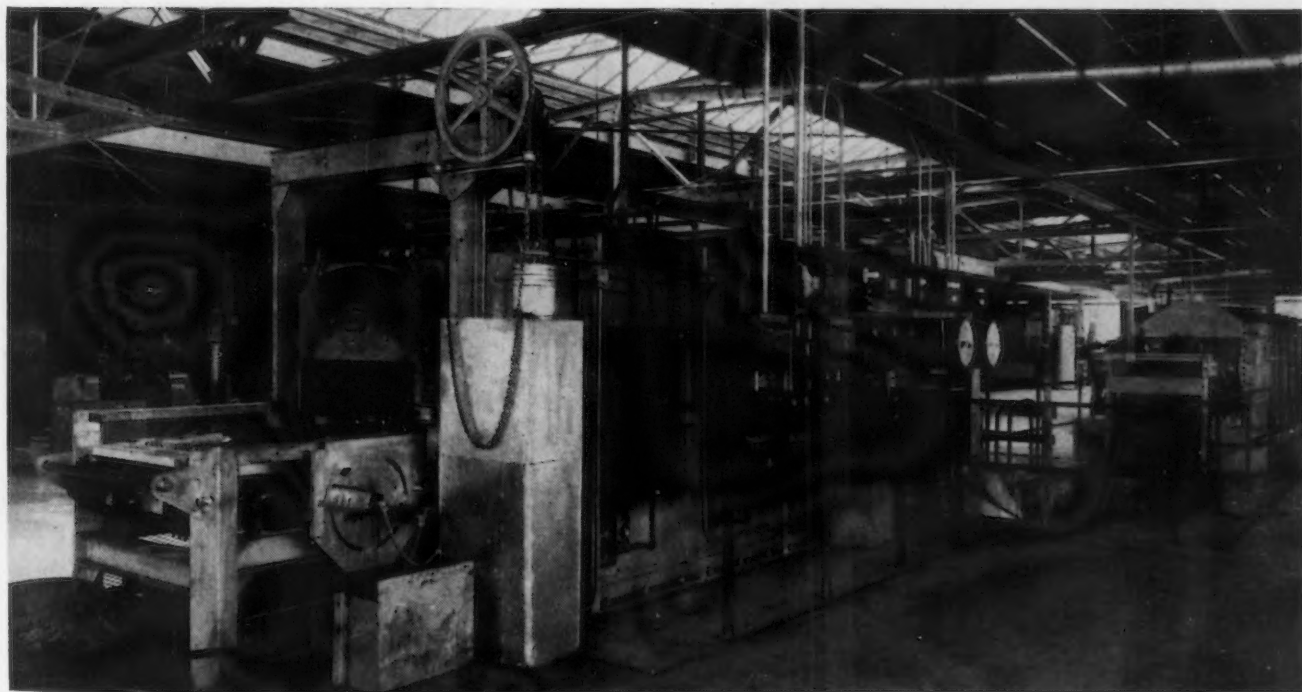
As the work leaves the quench tank, it is deposited automatically on the draw furnace conveyor, without manual rehandling. This eliminates the use of another furnace operator to charge the draw furnace, and enables one man to handle the complete harden-quench-and-draw unit.

The draw furnace conveyor consists of a heavy wire mesh belt, reinforced with heavy cross rods, and with malleable iron chains taking the actual load. The conveyor belt travels on alloy skid rails supported above the actual furnace bottom on refractory piers to permit under-firing.

The draw furnace is fired by low

pressure gas burners firing into combustion chambers below the conveyor, from which they are separated by spaced refractory tile forming the top of the chambers. The draw furnace is divided into two separately controlled zones and provided with recording pyrometers. The draw furnace conveyor is driven by a ratchet and pawl mechanism, on an intermittent cycle under the control of a time clock.

The unit operates under the widely varying conditions often encountered in a jobbing forge shop. For this reason actual fuel consumption values vary widely. For the average work, however, the fuel consumption ranges from 1.0 to 1.4 cu. ft. of 1000 BTU natural gas or its equivalent, per lb. of material treated on the entire heat-quench-and-draw cycle.



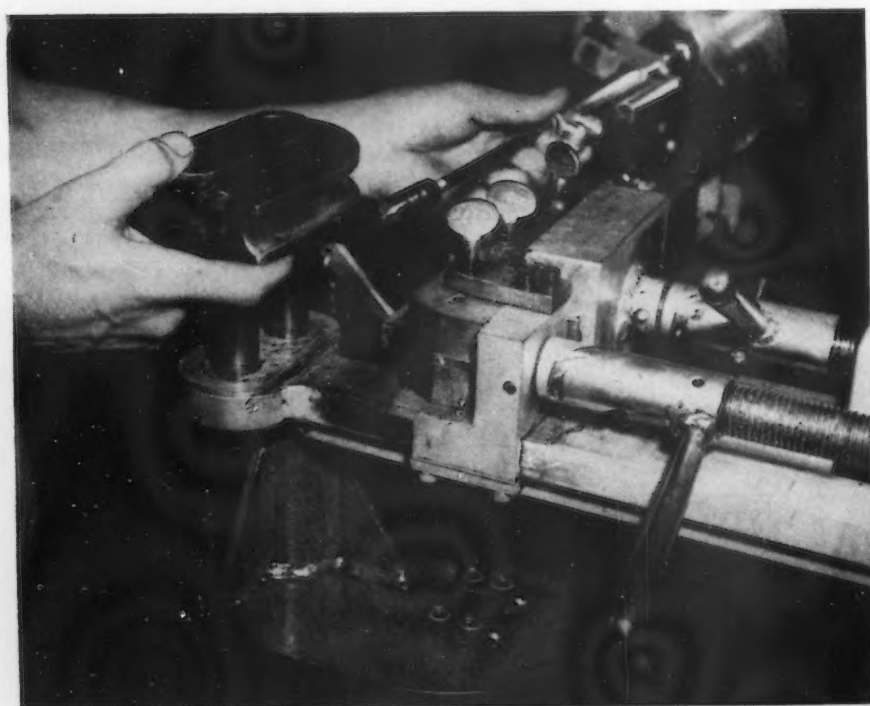
# Douglas Tube Bender Speeds

**G**REATLY reducing time of laborious hand bending by older methods, Douglas Aircraft Co. has designed and installed manually operated speed benders which increase the output per operator ten times or more per shift. With the bending method still in vogue throughout the aircraft industry, an experienced workman in a single shift period can produce a maximum of approximately

250 units on the average job. On a long run requiring few set-up changes the speed bender will turn out as many as 3700 parts per 8 hr. shift. Set-up time averages 7 to 15 min., the machine cam arrangement being numerically listed on a job analysis sheet furnished to the operator with the material. Tube sizes from  $\frac{3}{8}$  to 1 in. outside diameter by 0.049 in. wall thickness can be handled with the

present equipment. Designs for heavier tubing, though practical from an operation standpoint, have not proved necessary for Douglas requirements.

At one Douglas plant six of these machines are used. The cams can be set to produce as many as nine separate bends on one tube. The accompanying pictures show a typical set-up and its progression from the initial steps to completion of the part.



ABOVE

**F**IG. 1—By reference to a job analysis sheet furnished with the order, the operator selects correct radius block (operator's right hand) and mandrel (operator's left hand) for the specified tube size. Lubricated hardwood slide block is shown clamped in machine. Semi-spherical nosed mandrel insert is slid inside tube as it passes between radius block and slide block, eliminating possibility of tube collapse or distortion.



BELOW

**F**IG. 2—Referring directly to the job analysis sheet, the operator sets the stops for beginning of each bend as they occur along the longitudinal length of the tube. Note calibrated disk to right of center, easily visible from the work position, and used in next operation.

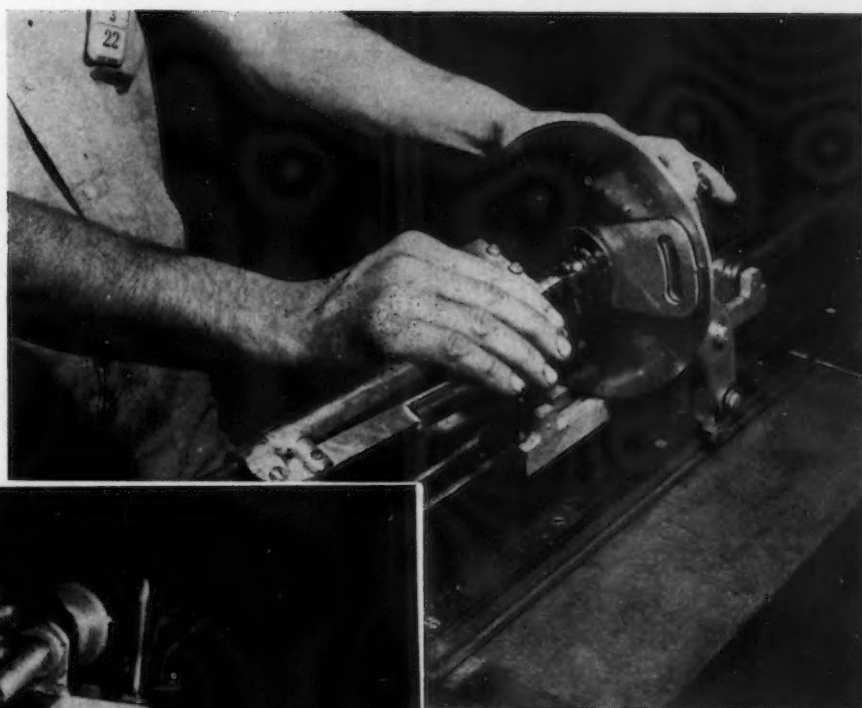


# Output

o o o

RIGHT

**FIG. 3**—Degree of rotation of the bend is set upon the calibrated disk and coordinated with the cam stops described in the next picture.

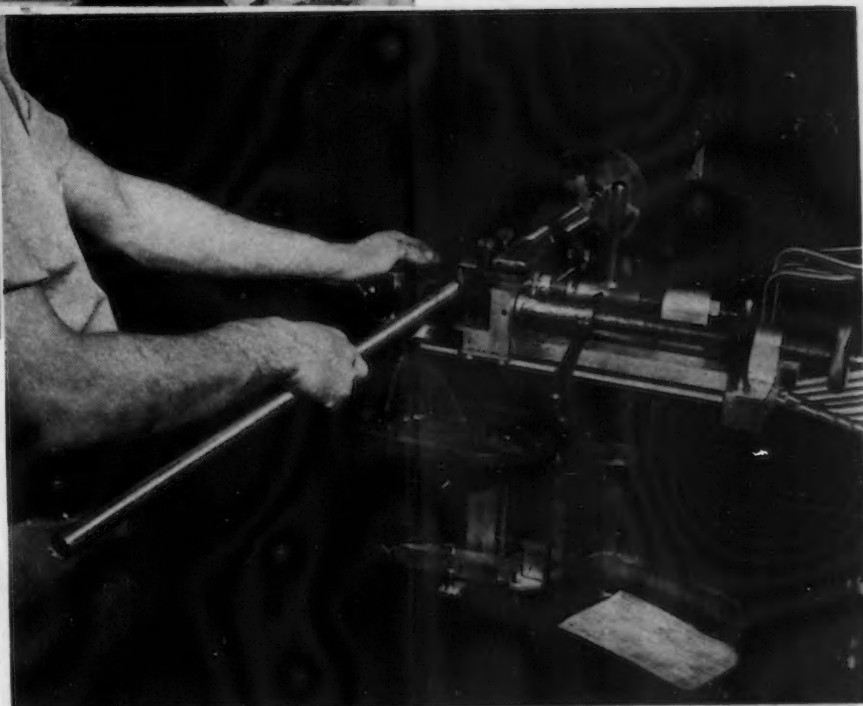


o o o

RIGHT

**FIG. 5**—Tubing section previously cut to correct length is slid onto mandrel and radius block adjusted to snug fit to hold tube firmly against slide block. Block is adjusted by handwheel and screw and has a cam lock for quick release.

o o o

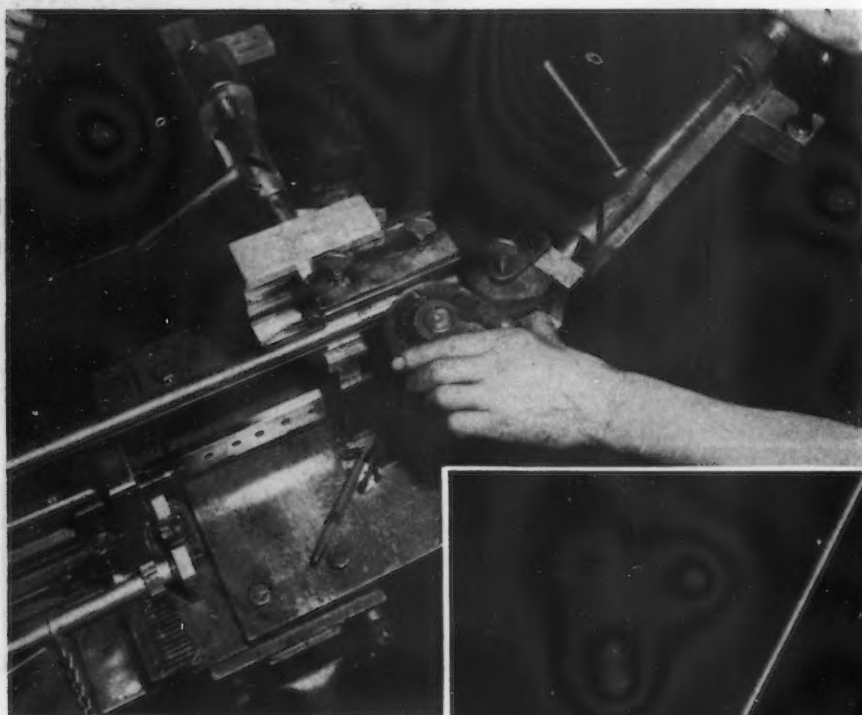


o o o

LEFT

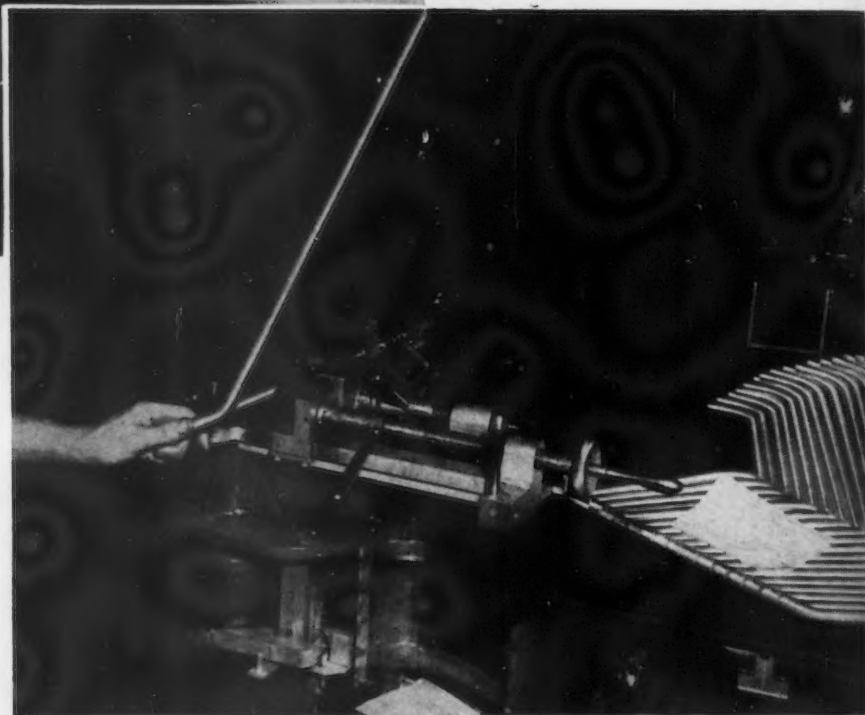
**FIG. 4**—Cam stops are set to allow degree of bend or radius as distinguished from angle of rotation. This provides an actual stop for each bend without further attention on the part of the machine operator.

o o o



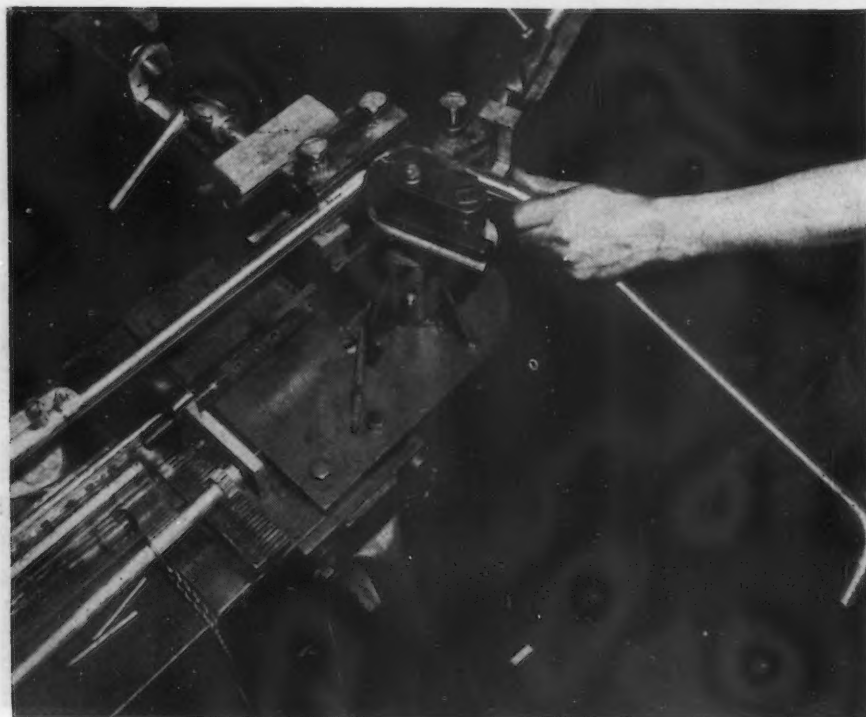
ABOVE

**FIG. 6**—Operator now proceeds with the first bend. The clamp extension from radius block is equipped with hand grip, and acts as lever to facilitate bends. Note cam lock on radius block adjusting screw.



BELOW

**FIG. 7**—Third bend is in different plane, requiring rotation of the tube, as guided by the calibrated disk. The progression of bends is foolproof; operator cannot make incorrect bend, providing original set-up is correctly made.



LEFT

**FIG. 8**—After rotation of tube, third bend is accomplished, completing total bends on the part.



o o o

BELOW

**FIG. 10**—Supervisor R. L. Goforth examines uniformity of absolutely identical parts produced with the speed bender in a fraction of the time used in former bending methods.

o o o



o o o

ABOVE

**FIG. 9**—Trigger spring release in operator's hand frees tube from the chuck mechanism, allowing it to be withdrawn from machine through the radius and slide blocks. Machine operator examines first part, which is carefully checked against the template on the initial run. After part is proved, no further check has been found necessary for repeat runs.

o o o

## Plastics and Soap Combined in Water-Base Paints

**P**LASTICS and soap today are combining in a number of products said to give superior results over the former products they are now displacing. A large variety of resins, synthetic and natural, are being dispersed in water by means of ordinary soap to be used as paints, rubber cement extenders, textile waterproofing and finishing agents, car polishes

and still other diversified fields. These new products, are saving large quantities of organic solvents vital to other uses.

One of the most revolutionary of the plastics-soap combinations is the recently perfected water-base paint. In use by the army, navy, and large war plants, this type of paint is free from poisonous, expensive and inflam-

mable organic solvents, is readily mixed up with a readily available substance—water, has high covering power, and great resistance to wear. Moreover, these paints dry in a few hours and may be applied to damp surfaces. Pigments, plasticizers and other materials are generally mixed in with the synthetic resin. (British patents 349,988; 539,288 and 334,567.)

# Design of Aluminum

... A review of general forging and die design principles relating to hammer forgings. Upset forgings and press forgings will be discussed in later articles. For an overall discussion of aluminum alloy forgings, the reader is referred to an earlier article, "Forging Aluminum Alloys," The Iron Age, Sept. 10, 1942.

**F**ORGINGS of aluminum alloy combine many advantages: controlled grain flow, absence of porosity, high allowable stress, ample filleting and great structural soundness. A wide variety of forged shapes can be produced in aluminum, allowing the use of fewer parts and frequently permitting them to serve more complex functions.

Complexity in the design of a forging, on the other hand, greatly increases die cost and often poses serious forging problems. The attainment of maximum simplicity in design for prescribed functional requirements offers, therefore, a straightforward challenge to the forging designer.

Hammer forgings generally start as bar or billet stock and are worked into their final shape by hammering operations in various dies. The complete cycle of forging steps is similar to that for steel forgings and includes fullering, edging or rolling, bending, blocking and finishing. Frequently the manufacture of a particular forging does not require all of these operations and the unnecessary steps are, of course, omitted.

*Fullering* is done on extremely simple dies. Its purpose is to reduce the cross-section and extend the length of the stock to the approximate proportions required. The accuracy of fullering depends in most cases upon the skill of the hammer operator. *Edging* gives the stock a rectangular cross-section and distributes the mass of metal to more definite positions with respect to the forging's ultimate shape. *Rolling* does fundamentally the same thing, but is employed to give the metal a round cross-section.

When it is necessary to alter the axis of the stock before blocking and finishing, *bending* dies are usually used. Frequently more than one set of bending dies is needed where the bending procedure is complex.

*Blocking* dies contain an approximation of the final forged shape and are used to work the metal into roughly final condition. These dies also serve to eliminate any excess material by forcing it out into the gutter around the die cavity. In some instances it is necessary to trim off this material (called flash) before the finishing operation.

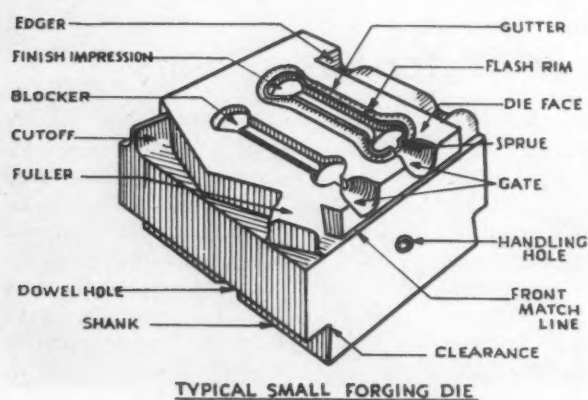
The only dies whose faces are brought together in the hammer-forging process are the *finishing* dies, which work the stock into its final shape and size. When the forging to be produced is extremely simple and the quantity to be made is small, the whole process can often be accomplished in finishing dies. In such instances the blows of the reciprocating die block must be carefully controlled so as to work the metal gradually.

One set of die blocks containing all the necessary die impressions may be used in the production of small forgings, Fig. 1. Larger forgings, however, may require the use of several sets of dies in order to prevent the equipment from being unwieldy. The greater the number of dies required for a particular job, the greater the relative original cost of producing individual forgings, and this cost can be absorbed only by manufacturing large quantities of the product.

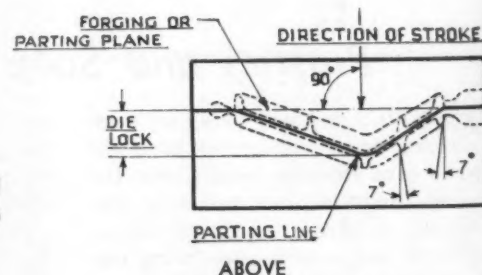
## General Design Considerations

The forging (or parting) plane is chosen by the designer, and lies at right angles to the direction in which the reciprocating die travels. It is the plane from which all draft angles are calculated, and must be chosen with considerable care in order to produce forged parts having greatest functional value and requiring little or no subsequent machining.

The line along which the lower and



LEFT  
FIG. 1 — Typical small aluminum forging die.



ABOVE  
FIG. 2—Forging or parting plane and parting line distinguished. The die lock shown should be compared with that in Fig. 3.



# Hammer Forgings

upper dies separate is known as the *parting line*, and is not to be confused with the *parting plane*. (See Fig. 2.) It may be straight and lie along the forging plane; or it may be made irregular to accommodate bends, lugs, webs and the like in the forged part. It is often possible to design a forging so that all the impression is within one die. Single dies of this sort may, nevertheless, require broken (irregular) parting lines.

As a general rule it is preferable to run the parting line through the profile of the forging's web—if there be a web—and the profile need not be on the center line. Of course, this rule cannot be followed in the case of single dies, for obvious reasons.

When the parting line of the forging dies is irregular from any view, the resultant meshing of the dies is called *die lock*, Fig. 3 (see also Fig. 2). When choosing the forging plane, the designer should be careful to include the effects of die lock in his calculations so that unbalanced sidewise loads on the hammer can be avoided. A sidewise load of this sort can be compensated by placing an opposing lock (counter-lock) in the die at a position away from the forging surface, but such a remedy should be used only in cases of strict necessity.

The working of aluminum elongates the grains of the metal and produces a fibrous internal structure which has directional mechanical properties. The higher strengths which result in the direction of grain flow should be utilized to best advantage in designing forgings.

It will frequently be found more economical and practicable to bend a part after it has been forged, rather than to forge the bend into the part. Bending may be done while the metal is still hot, or even after it has cooled. Allowances for such bends should be made when designing, since bending elongates the fibers on the tension side and builds them up (buckles the metal) on the compression side of the metal. The radii of bends should

SINKING a die that will be used in forging an aluminum aircraft part.



be not less than twice the thickness of the part at point of bending.

To obtain a more efficient product, or to produce a part which otherwise could not be forged according to specifications, it is sometimes necessary to twist after forging, and a round section of adequate length for clamping and twisting should be allowed. The tolerance for twisting should be  $\pm \frac{1}{2}$  deg.

## Details of Design

*Draft angle* is the taper given to the side walls of the die impression, and is necessary to prevent the forging from sticking in the die (see Fig. 4). Drop forgings normally require a draft angle of 7 deg. for depressions in the die and for average-size plugs or projections. Plugs which form very deep cone frustrums will require a draft angle of 10 deg., however. Draft angle is a function of die motion, and is always calculated from the forging plane, not from the parting line.

With modern high impact velocity drop hammers, it is possible to get by with draft angles as low as  $1\frac{1}{2}$  deg. In such hammers, the return velocity, as the dies are parted, is almost as great as the impacting velocity. This rapid parting of the dies permits the

explosive force of the volatilized lubricant to effectively blow the forging from the die. This rebound is governed by the ratio of the weight of falling parts and the mass of metal in the anvil. These big hammers not only have heavier ram weights but proportionately much heavier anvils. Some of the biggest steam hammers in the country are being used on aluminum forgings.

When the regular draft angles do not match at the parting line, the draft in one die is increased until the contours of both meet at the parting line, Fig. 4. As an alternative, a small ledge can be added in the shallow die, but this method is not so satisfactory and should be used only when the previous method is not feasible.

*Corner radii* of sufficient amplitude must be provided on forging flanges if cracked dies are to be avoided. The chart, Fig. 5, shows recommended values. Flanges should also be as thick as possible to reduce die breakage and die cost. It is often important, however, that flange thickness be reduced to a minimum because of weight and other factors, and the designer must exercise his ingenuity if the forged part is to perform its proper func-



The dies used in forging an aluminum alloy spray gun handle.

tions and still be practicable from a manufacturing standpoint.

On relatively wide flanges, where a flat with minimum radii at the corners would be possible, the added difficulty of forcing the metal into such corner radii makes it desirable to design these flanges with a full radius at the top, Fig. 6. On bath-tub-type forgings the inside *edge radius* should be equal to the wall thickness whenever possible. The outer edge, of course, should not be given a radius. Corner and edge radii should remain constant along ribs and flanges in order that die sinking may be done with one tool, even though the section tapers in height.

Small fillets restrict the flow of metal into the deeper crevices of the die, and may result in a lap, a folding over of the metal on itself. If laps are to be avoided, fillets should be made as large as the design allows. Small fillet radii also cause excessive die wear at the fillet, or cause die breakage because of the high pressure needed to force the metal over the fillet. The designer must therefore remember that the use of small radii on very deep and narrow plugs, or on very wide ones, will result in increased cost of dies and forgings. The chart, Fig. 7, showing minimum fillet radii values, is based for simplicity on plug

depth alone. These values hold for plugs of width-to-depth ratio approximating 2:1, and for all T-sections.

Fillet radii that vary will cause an increase in die price because they must be tapered by hand. It is usually feasible to retain a constant radius over most of the length of a moder-

ately changing section without penalizing the design to an excessive degree, and this should be done whenever possible. The need for large outer radii on the bath-tub type of forging should be emphasized, since die breakage at this point presents a considerable problem. As a minimum, such an outer radius should be equal to the fillet radius plus the thickness of the thinner web. An even larger radius than this minimum is often possible and always highly desirable.

### Problem of Thin Webs

*Thin webs* present a relatively great area of metal in contact with the cooler dies, and therefore dissipate their heat rapidly. Being cooler than the rest of the forging, they become harder to forge and the whole part must be hammered more severely. The result is rapid breakage of dies. Deeper cavities in the dies may fill or offer strong resistance to filling before the web is brought down to size. The flow of excess metal into the gutter will then shear the various sections into separate parts. If the thin web must be retained, the fillet radii must be increased considerably. The same difficulty restricts the use of webs extending beyond the flanges of H or U shaped sections.

Two methods are commonly used to produce better forgings and better structural parts when the above conditions prevail. The first is to thicken the web gradually from the center outward and to increase the fillet radii; the other is to punch out a

FIG. 3—Die lock forces should counterbalance each other as at the left. (P.L. is the parting line.)

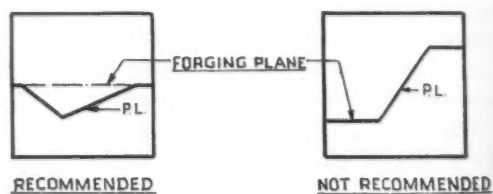
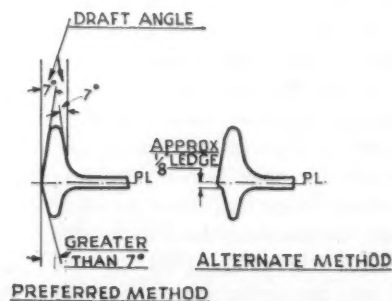


FIG. 4—Matching up draft angles of unequal flanges.





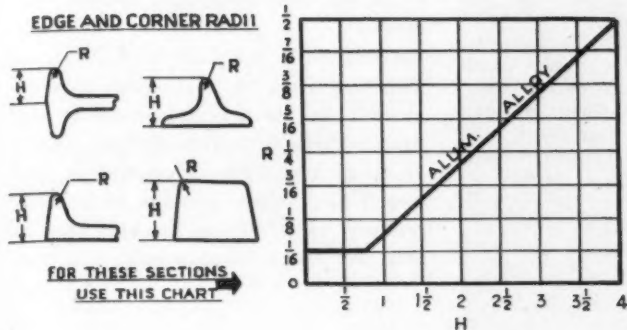


FIG. 5 — Recommended edge and corner radii for aluminum forgings.

large portion of the web, Fig. 8. The latter expedient permits using as a gutter that portion of the web which later will be punched out. An unsupported thin edge around the punched-out section may not meet strength requirements and an improved section may be obtained by beading the cut-out. On small parts with fin-like lateral projections from a globular center, the fin may be drop-forged to a minimum thickness of 1/16 in. with a width of no more than 1 in.

Flash may be trimmed off with as much as 1/16-in. undercut, or it may be left to protrude 1/16 to 3/16 in. on larger forgings. The prices of commercial forgings do not include any special grinding or finishing of the trimming line, as all trimming operations are difficult to control and those requiring high accuracy entail additional cost. In cases where any part of the trim line must be held closely to size, detailed notes to this effect should be placed on the designer's drawing.

### Holes Punched Hot

Holes in lugs require the forging of a local depression until a web of 1/8 to 1/4 in. thickness remains. The web is punched out while the metal is hot. The punching operation tends to distort adjacent sections of the forgings, especially if the web is thicker than the surrounding flanges. To avoid such distortion, considerable area should be left between the flange and the punched hole. Holes should start at the point of tangency of the fillet and the web; they should not include any of the fillet and draft of the flange.

When an irregular hole is to be punched in a web, the final trimming of the flash and web can be accomplished more easily if a small amount of the web is left around the inside of the part to provide a bearing with which to hold the forging during trimming operations.

The tolerance on the length of a forging may be well in excess of that

allowed on the machined parts. For links and similar parts, where bosses to be machined are set at some distance from one another, it is a good practice to make one boss circular and the other boss (or bosses) elongated by plus or minus the forging length tolerance, even if a portion of the end



FIG. 6 — A full radius is preferred on relatively wide flanges.

boss must later be machined off to avoid interference (see Fig. 9).

### Tolerances

Thickness tolerance applies to the overall thickness of the forging, and varies with the net weight of the product being fabricated. It is figured separately and independently of any other tolerance, and is applied in a direction perpendicular to the parting plane, or parallel to the ram travel. Tolerances closer than those listed in Table I will

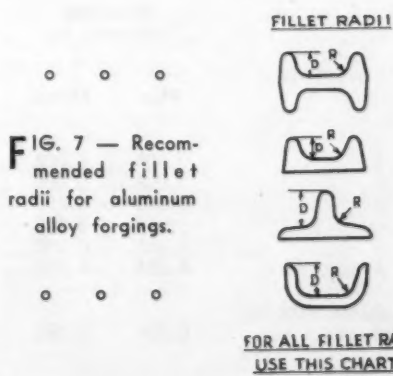


FIG. 7 — Recommended fillet radii for aluminum alloy forgings.

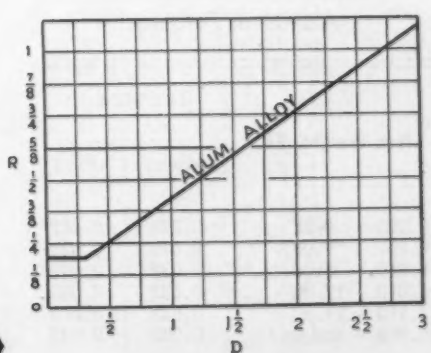
necessitate the use of either a coin press die or a complete cold restriking die.

Mismatch is caused by slight misalignment of the forging dies, and results in a shift of one part of a forging along the parting line from its relative position to the other part of the forging. Shrinkage, which results from the cooling of the metal, causes a dimensional contraction in all directions. The designer should add enough metal to compensate for shrinkage and mismatch (Tables II and III). The allowance should never be the sum of the two. Whichever factor requires the greatest tolerance in a given direction governs the allowance. If stock for machining is necessary, it must be in addition to shrinkage and mismatch tolerances.

The designer should specify the largest practical tolerances for die wear that the design will permit. In commercial forging practice the impressions are machined to the lower limits of the drawing dimensions, and when the impression has been worn to the upper limits the die must be resunk. Hence, if the tolerances on a particular part are halved, the die life will also be cut in two. Large dimensions (such as length) should be allowed to vary by  $\pm 1/32$  in. per foot (0.003 in. per in.). Dimensions across the parting line (such as thickness) will in most cases fall within  $\pm 1/32$  in., although quite small forgings can be held within  $-0, +1/32$  in. In general, short dimensions within a die (width) may be held to  $\pm 1/32$  in. or even to one half of this figure if such limit is required.

Straightening tolerances must be applied independently of any other tolerances. Any deviation from the commercial tolerances given in Table IV will require the use of a straightening die.

When surfaces of parts are to be



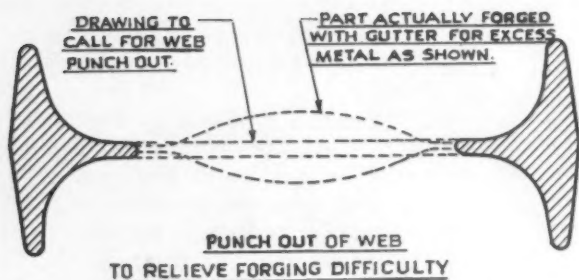


FIG. 8—By punching out thin webs which tend to cool rapidly and become unforgeable before the heavier sections are fully formed, breakage of such dies can largely be eliminated.

tions, hammer blows and re-heats required for its production. These are determined by the amount of deformation required to force the forging stock from its original shape to the final contours desired. Hence, simple forgings are cheaper on a cost per pound basis than complex ones. Protruding ears, severe necking down, thin webs and the like raise the cost

machined, the designer should show or specify the allowances necessary for finishing. The minimum allowance on small and medium-sized forgings is 1/16 in.; for large forgings, 1/8 in.

### Cost Considerations in Design

Costs are influenced by many variables beyond the designer's control, and are not easily determined in advance. A reasonable estimate may be made, however, through the use of certain guides. The total cost of a forging is made up of three principal items: die cost, tooling setup cost, and cost per pound of material in the finished forging.

The total number of identical forgings made from one set of dies is the determining factor when die cost per unit is calculated. Tooling setup charges must, of course, be distributed only over the particular batch of forgings being fabricated at a given time, as such costs recur each time the dies on a hammer are changed over from one job to another. The cost per pound of material used in a forging, on the other hand, is governed by the size and complexity of the forged part.

Other things being equal, the size of a forging indicates the dimensions necessary for the die blocks. Thus the die cost for simpler forged shapes varies roughly as the smallest rectan-

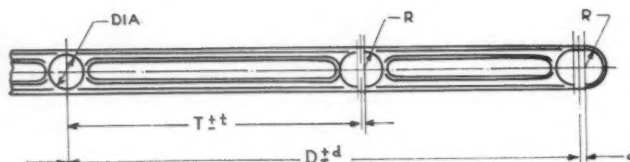


FIG. 9—Proper design of bosses for long aluminum forgings.

gular area in the parting plane which will contain the pattern. When the part to be forged requires extremely complex dies, however, the complexity of sinking such dies must be included in estimating die cost. A skewed or warped parting plane, for example, such as would require blending of the parting faces and rotation of the die blocks during die sinking, would increase die cost considerably (see Fig. 2).

The cost of a tooling setup is difficult to pre-determine by simple calculations. It is usually such a small part of the over-all forging cost, however, that it is sufficient to figure the charges as directly proportionate to the rectangular area of the forging.

The cost per pound of a forging depends upon the number of opera-

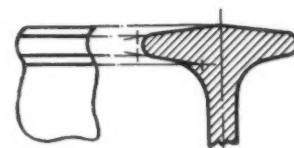


FIG. 10—Method of showing projected views of a forging detail.

per pound rapidly, as do other intricacies.

### Preparing the Drawings

Forgings are often difficult to picture. The draftsman is therefore called upon to exercise special care that his forging drawings are clear and readable. They should always be full size, and separate drawings must be made

TABLE I  
Thickness Tolerances for  
Aluminum Forgings

Net Weight, Lb.	Tolerance, In.	
	Minus	Plus
0.000 - 0.25.....	0.010	0.032
0.251 - 1.00.....	0.015	0.032
1.010 - 4.00.....	0.032	0.045
4.010 - 17.00.....	0.032	0.062
17.010 - 24.00.....	0.032	0.078
24.010 - and up.....	0.032	0.093

TABLE II  
Shrinkage Tolerances for  
Aluminum Forgings

Length or Width, In.	Shrinkage Tolerance, In.	
	Plus	Minus
1.....	0.004	0.002
2.....	0.008	0.004
3.....	0.012	0.006
4.....	0.014	0.008
5.....	0.020	0.010
6.....	0.024	0.012
For each additional inch, add.....	0.004	0.002

TABLE III  
Mismatch Tolerances for  
Hammer Forgings

Net Weight, Lb.	Mismatch Tolerance, In.
Up to 2.500.....	0.015
6.250.....	0.018
8.500.....	0.021
15.000.....	0.024
20.000.....	0.028
25.000 and up.....	0.032

TABLE IV  
Straightening Tolerances for  
Hammer Forgings

Length or Width, In.	Tolerance, In.	
	Com-mercial	Close
0 to 9 incl.	1/64	0.010
9 to 18 incl.	1/32	0.015
18 to 30 incl.	3/64	0.030
30 to 45 incl.	1/16	0.040
45 to 60 incl.	3/32	0.050
60 to 80 incl.	1/8	0.060

of the forging blank and the finished part, with forging plane and parting line shown and labeled as shown in Fig. 2.

Cross-section sketches should be used frequently as they assist the die sinker in visualizing a forging part. When using such projected views, lines should be drawn to show the intersection lines of corresponding surfaces, Fig. 10. The desired direction of grain flow should be shown on the drawing, but arrows for this purpose must be placed outside any view of the part.

Drawings of parts requiring subsequent machining must show any portion of the forging blank which is to be machined off in dotted outline, if confusion is to be avoided. Allowance must be made on the rough forging



**A**N aluminum alloy forged crankcase section for one of Uncle Sam's fighting air-planes, being removed from the dies of a forging hammer.

to provide sufficient material for finish machining. This additional material should include the tolerance on the over-all dimension, the corner radius (if it is to be machined off) and such amount as is necessary to compensate for warpage or mismatch.

It is difficult to establish fixed rules for the dimensioning of forgings, since the complexity of a forging may indicate the manner in which it should be dimensioned. All dimensions, however, should be given to the deep-

est points in the die, or to the point of the cutter tool.

It is the draftsman's job to dimension his drawing of the forging blank so that it can easily be checked against the machining drawing to insure sufficient material for finish work, or to meet strength requirements. Uniformity should be preserved in dimensioning; inches and fractions are to be used in all instances except for reference dimensions, which may be in decimals.

## Inspection History Stamped on Part

**A** SIMPLE system of marking parts in process so that a glance reveals the complete history of that part through the various manufacturing operations and inspections has been adopted for certain of its products by Aircraft Parts Production Corp., Ann Arbor, Mich. On the part the record shows the identity of every inspector through whom the part passed, what his action was, whether the part had to go back for re-working, who sent it back, who approved it after it was reworked, etc.

Forming the basis of the marking system is an "operations sequence" marker, produced by New Method Steel Stamps, Inc., Detroit. This marker is a simple hand stamp carrying a number of consecutive numerals corresponding to the number of operations for which inspection is required. These numerals are impressed on a casting, for instance, immediately after a snagging operation in a position where they will not be obliterated during manufacture.

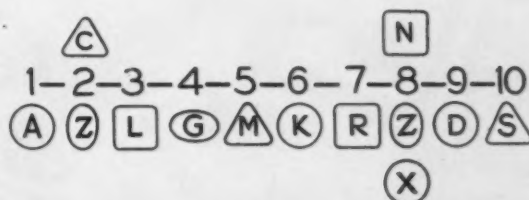
The figure illustrates the manner in which this system may be applied, using simplified code inspectors stamps in combination with the sequence stamps. Each inspector is assigned a stamp carrying a specific letter of the alphabet. Night and day shift inspectors may be distinguished by different borders around the letter.

After each operation, the inspector involved marks the part above or below the numeral corresponding to the operation he is checking. If he passes the part, he puts his mark below the numeral. If he rejects it, he puts his mark above the numeral.

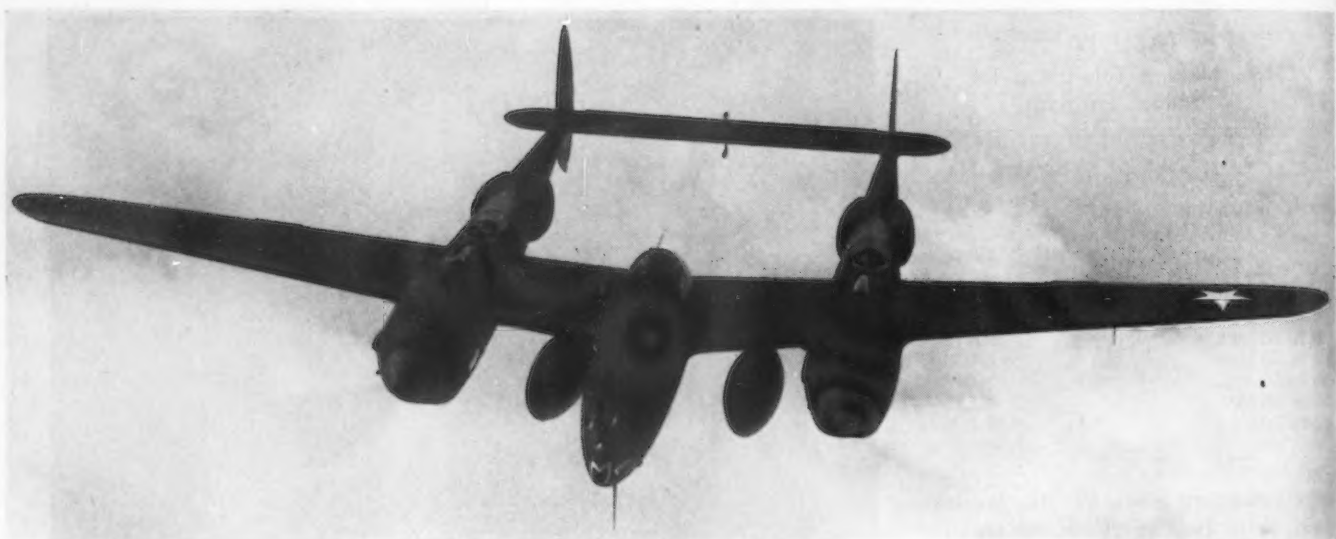
In the case of rejected work that is reclaimed, the inspector then places his mark below the numeral to indicate acceptance. Thus is recorded not only the fact that the operation has been rejected, then subsequently passed, but both the unsatisfactory manufacturing operation and by whom rejected are permanently recorded.

Many other checks can be worked out for specific operations and inspections by using this method of marking. The value of the marking system such as this to factory service men and "trouble shooters" in the shop or in the field is obvious.

**T**HE numerals indicate the sequential operations on a part and the letters identify various inspectors. The inspector's stamps above the operation sequence line indicate that operations 2 and 8 were rejected by inspectors C and N, and after reworking, passed by inspector Z. Operation 8 was also rechecked by inspector X.







## Fabrication of Tear Drop Tanks

**T**WO fuel tanks which may be dropped at the will of the pilot just about double the normal range of the Lockheed Lightning P-38. Each tank, which is fastened by bomb shackles under the inner wing section, carries 165 gal. of gasoline, weighs 90 lb. empty, 1000 lb. full. At top speed, two such tanks filled reduce the plane's speed only 4 per cent.

The tank, 10 ft. long, and 27 in. at its widest diameter, is made of 1010 steel, 0.024 in. thick, and sells for less than \$100. It supplants a \$678 aluminum tank. The half shells, already stamped out, and the other parts are delivered to a Lockheed plant near Los Angeles by subcontractors.

The first operation in the Lockheed

plant is the torch welding of the sump plug flange to the left hand shell. Then the filler well adapter assembly is seamwelded, by a special series welder, to the left shell (Fig. 1). Bulkheads are welded in with two special semi-automatic welding machines (Fig. 2). The half shells are placed on a moving conveyor, each in its own cradle, spaced 18 in. from one another. Flanged gussets and other parts which will hold the tank to the plane are spot welded to the stressed bulkheads by a series of gun welders on monorails, enabling the operator to follow the tank along the floor (Fig. 3).

The two halves of the pan are seamwelded to the halves of the tank with a portable seam welder supported from a pneumatic counter balancer. Since the linear travel of the wheels on the welder is approximately



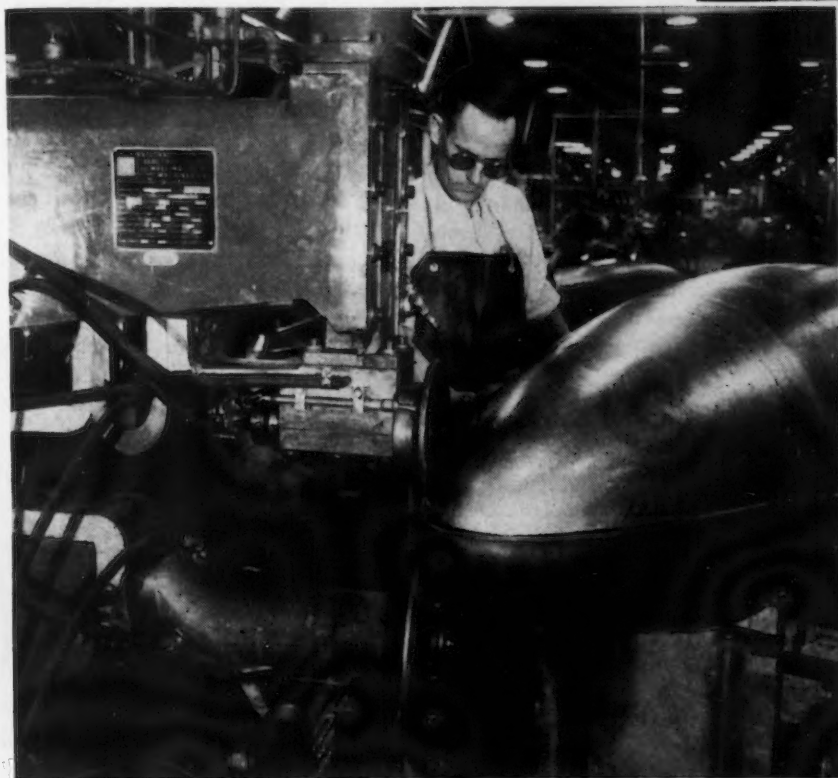
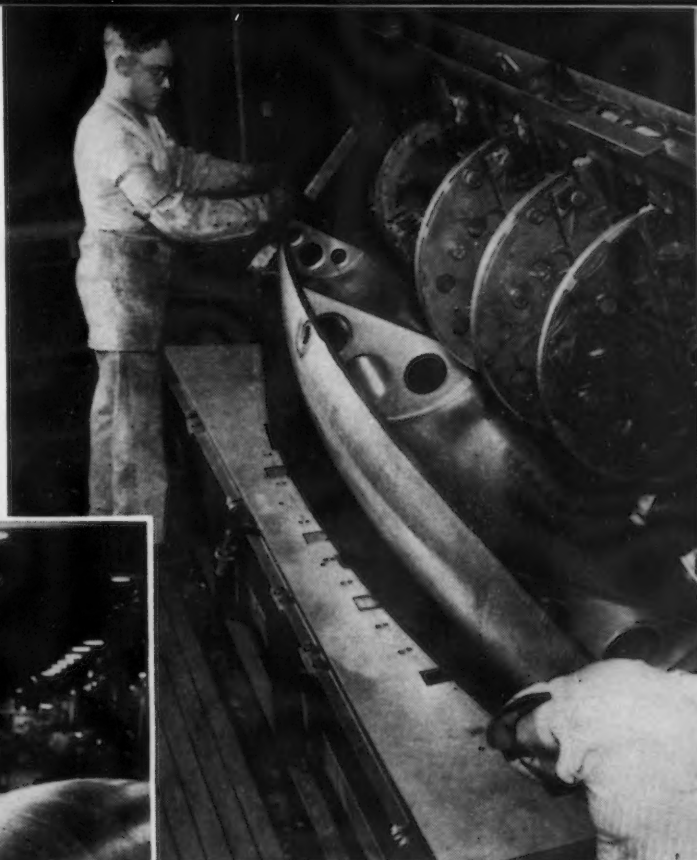
**FIG. 1—**Seam welding adapter assembly of the filler well to the left hand shell. The weld is made on a double contoured surface having a rise of  $\frac{3}{4}$  in. in 90 deg. of rotation, by a special series welder. When the two welding wheels contact the skin of the tank and the adapter assembly, the welding circuit is closed by the circular copper alloy short circuiting bar which is horizontal and can be seen in the photograph just below the skin. Since the welding current flows through the sheets at two points, two welds are made simultaneously and the 360 deg. of welding is completed in 185 deg. actual rotation of the upper heads.

the same as that of the conveyor, the wheels were designed to rotate in the opposite direction to that of the conveyor, with the result that the welder actually moves less than 18 in. during the welding operation. Small parts are put in place, altogether, through nine welding stations, and attachment hooks are bolted in place by power driven socket wrenches.

The right and left half shells are clamped together using prepunched

#### BELOW

**FIG. 4** — Seam welding the two halves together is done at a rate of 60 in. a min., a total of 4 min. a tank. The tank is taken off the assembly line for this operation and placed in a special cradle.



**FIG. 2**—Welding of bulkheads is done in two semi-automatic welding machines, the second of which is shown above. Three bulkheads have previously been welded in the first machine and the other four are to be welded here. The half shell is supported at the bulkhead stations by copper alloy electrode bars machined to fit exactly the outside contour of the tank section. When the hinged cover is let down and electrical power applied, roller spot welds are motor driven around the arc. Except in the two center bulkheads where the welds are spaced  $\frac{1}{2}$  in. apart, the welds are  $\frac{3}{4}$  in. apart, center to center. Welding time in each of the two machines is 1 min.

holes for correlation. The parts are tackwelded together and the tank is taken off the line, placed in a cradle, and run through a seam welder (Fig. 4). Excess material is trimmed off with an electric shear, the tail plug is torchwelded in place and the tank goes back on the conveyor for leak testing.

After a trip to the slushing table, at which each tank has 30 gal. of non-inflammable zinc chromate primer sloshed inside it to form a protective coating, the tank is dried, given a final pressure test and a permanent tail plug. It is then placed on a second conveyor for a hot Turco bath cleaning solution, cold water rinse, drying, and painting. The same conveyor carries the tank up through a window into the shipping building.

The assembly conveyor is 475 ft. long, and carries 36 cradles. A tank is finished, on a three-shift average, every  $4\frac{1}{2}$  min.

#### RIGHT

**FIG. 3**—An overhead monorail makes it possible for the gun welder to follow the moving conveyor along the floor. In this photograph, the part being welded to the shell is a "keelson angle," which like the keel of a boat distributes the load over the whole tank. The conveyor moves at 43 in. a min.



# Additional Notes on the

Since publication of the first report\* on the use of subzero temperatures in the metal working industry, several additional interesting applications have been reported to THE IRON AGE.

A maker of precision gage blocks has reported a substantial increase in

\* *Cold Treatment of Metals*, THE IRON AGE, Feb. 25, 1943 p. 37.

the life of the surfaces of gage lapping blocks when the blocks are subjected to subzero treatment.

In order to procure a truly plane surface when lapping gage blocks, three lapping blocks are used. The accuracy of the plane surface of the gage block is directly related to the accuracy of the surface of the lapping blocks. The planeness of the lapping blocks is subject to two distortions—a time distortion due to the release of strains arising from the ageing of the blocks and a distortion due to wear irregularly produced on the surface of the lapping blocks due to variable hardness. Of these two distortions,

the time distortion is of greatest moment.

When the lapping blocks are stabilized by a cycle of chilling at  $-120$  deg. F., the number of blocks which can be lapped between resurfacing of the lapping blocks is increased 2000 per cent, according to one report of a user of a Deepfreeze chilling machine. This reduction means that instead of resurfacing the lapping blocks every two or three hours, the resurfacing is necessary only every two or three days.

Another plant has reported considerable success in the use of mechanical chilling equipment for producing a shrink fit of a steel tapered roller bearing into a housing, Fig. 1. This job is accomplished by shrinking the male part by treatment at  $-120$  deg. F. Approximately a half min. per piece is required for this treatment.

A gage maker reports that the following seasoning operation is being used successfully to prevent changes in gage size after finishing. The treatment for the thread gage shown

in Fig. 2 is 2 hr. in a chilling unit, 2 hr. in boiling water and then 2 hr. again in the chilling unit, with this cycle repeated six times. Other gages are rated according to size and material. With some material, an oil or salt bath is used for the heat treatment. The sequence of the production of the thread gage is: (1) machine, heat treat, rough grind; (2) chill and heat treat; (3) finish lapping.

A procedure for use in calculating the rate of production obtainable in reducing a quantity of work to a specified temperature, as recommended by one of the makers of chilling machinery, is illustrated in the following example.

**Problem:** It is desired to chill steel bars  $4\frac{1}{4}$  in. dia. x 4 in. long from 80 deg. F. to  $-120$  deg. F., or a temperature change of 200 deg. The following procedure will show the number of pieces which can be handled per hour, using Carrene No. 1 as the convection fluid.

**1st Step:** Using the following formula, calculate the number of BTU's which must be removed.

$$H = WDS$$

Where H=contained heat to be removed.

W=weight of material,  
D=degrees temperature change desired,  
S=specific heat of material.

The weight of the material is about 48.23 lb. per ft., or 16.07 lb. for the 4 in. bar. The specific heat, as indicated in the accom-

FIG. 1—The tapered bearing shown here is shrunk by chilling to  $-120$  deg. F. and then fitted into the housing in the center of the casting.



TABLE I  
Specific Heat of Common Materials

Aluminum	0.212	Rubber, hard	0.339
Brass	0.092	Silver	0.056
Bronze	0.104	Steel	0.118
Cast Iron	0.113	Tantalum	0.033
Copper	0.092	Tin	0.054
Glass	0.180	Tungsten	0.034
Marble	0.206	Zinc	0.093
Nickel	0.109		



# e Cold Treatment of Metals

panying table, is 0.118. The temperature change is 200 deg. Applying the above formula ( $H=16.07 \times 200 \times 0.118$ ), 379.252 BTU's must be removed from each piece of steel.

2nd Step: Dividing the heat removing capacity of the chilling machine by the number of BTU's per piece which must be removed will give the production capacity of the machine for the piece of work in question. Taking, as an example, the Deepfreeze Cascade -120 deg. F. unit, which will remove 1000 BTU's per hr., the calculation is

$$\frac{1000}{379.252} = 2.64 \text{ pieces per hr.}$$

All users of chilling equipment do not use a convection fluid, the choice resting on the nature of the work being handled. However, when a convection fluid is employed, a du Pont product called Carrene No. 1 (methylene chloride) has been found to be very effective. This material is non-inflammable and remains highly fluid

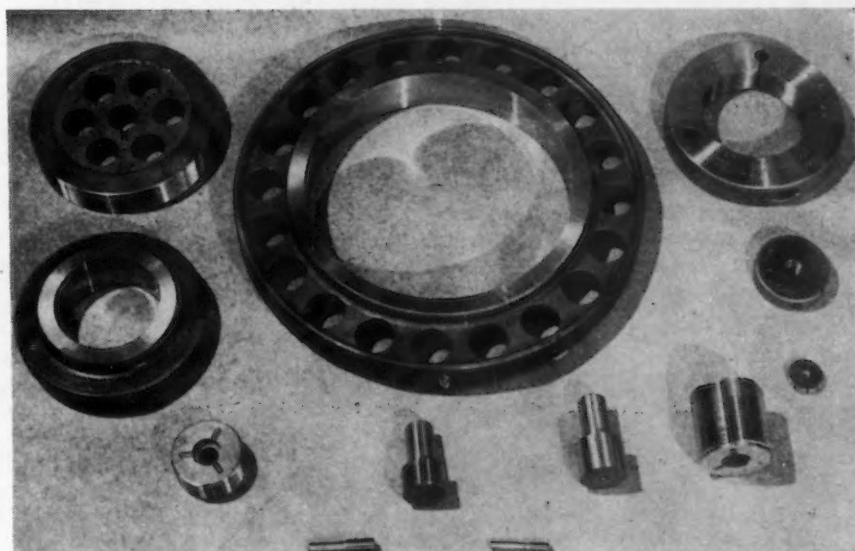


FIG. 2—Seasoning these gages by treatment in a chilling unit helps prevent growth during shipment and when in use.

at -120 deg. F. The use of alcohol or acetone or a mixture of both as a convection medium introduces a fire

and explosive hazard, particularly since chilling units are often located near a heat treating furnace.

## Heatronic Unit Speeds Molding of Thermosetting Plastics

ANOTHER contribution of the chemical engineer to further the war effort is the development of Heatronic molding by Bakelite Corp., unit of Union Carbide and Carbon Corp. Parts molded of Bakelite thermosetting plastics, such as the phenolics and ureas, can now be produced by this process in a matter of seconds rather than minutes. What this development will mean after the war for civilian products made of plastics is immediately apparent; much faster production, with consequent economies; uniform parts and much larger moldings, some as heavy as 50 lb. on equipment available at present.

In Heatronic molding, radio frequency waves add their part to heat and pressure which have always been required for plastics molding, actually generating an "artificial fever" in the plastic parts which are to be molded.

In effect, the Heatronic molding process utilizes high-frequency heat-

ing by generating current in an electrostatic field. A preform or rough shape of the plastic article to be molded is placed between two plates of the Heatronic equipment just before it is to be put into the mold. The

TEST cups molded of high impact resistant phenolic material with mascerated cloth filler and 16,000 lb. pressure. (Left) Standard molded cup not filled. (Right) Heatronic molded cup cured in 14 sec.



plates themselves stay cool, but the rough preformed "pill" of plastic becomes uniformly warm all through as the radio current is generated. Because it is evenly heated throughout its thickness, the plastic preform when transferred to the mold flows easily into all of the corners and sections (see illustration) to produce a finished, strong Bakelite plastic part. Much less pressure is required and the curing is effected in much less time.

In addition to the time saved, two other advantages are of extreme importance. First, thermoplastic parts can be molded in thicknesses and sizes hitherto impractical with standard molding methods and conventional equipment. Second, existing molds and molding press equipment may be used to produce plastic parts which, ordinarily would have required a long wait for the manufacture of high pressure presses.

# Steel, Plastics and Zinc Used in

**T**HE ever increasing demand of the war effort for greater production has been met in no small degree by the application of plastics in many places throughout the vast tooling program on which we are now working.

Here at Vega Plant I, the application of plastics in the form of drop hammer dies has made great strides ahead. Kirksite dies with Plastalloy punches have given wonderful results.

By JOHN C. WRIGHT

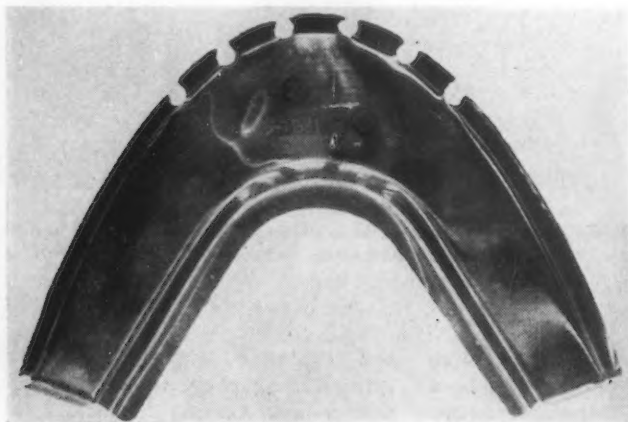
*Tool Research Engineer, Vega Plant I,  
Lockheed-Vega Aircraft Co.,  
Burbank, Cal.*

Material was stacked seven parts high and fastened down, then transport parts to the hydro-press for forming. After the forming by hydro-press, a hand finishing operation was necessary to complete the forming of the skin stiffener.

From the hand finishing, these parts were sent to the part numbering machines and then to the heat treating ovens; from heat treat to inspection, and then to stock. This sequence of operations required 4 hr. 56 min. for 50 parts as determined by time study.

## New Method Employed

The new method uses a progressive die set-up built of a combination of



**LEFT**  
**FIG. 1**—Skin stiffener for "dorsal fin" on B-17 F bomber. It is now made in a pair of progressive dies, including stamping the part number thereon.

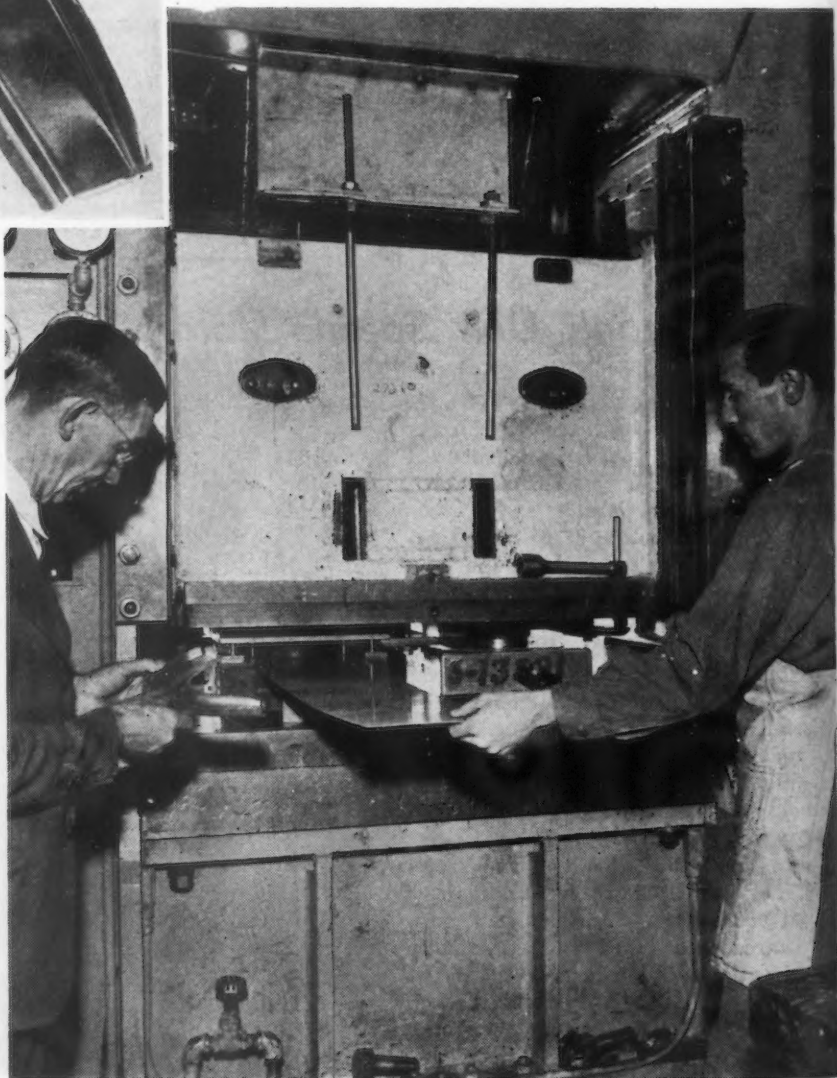
**BELOW**  
**FIG. 2**—Set-up of the two dies in a 150-ton Verson press. The author is seen at the left.

This plastic has a cold flow under impact from the hammer that allows the plastic to reach all of the extremities of the die, thus producing parts that have never before been obtained with metal punches.

Baker Oil Tool Co.'s resin, a phenolic with wood flour and walnut shell flour for fillers (and more recently an asbestos filler) has played a large part in the construction of drill jigs and bases for punch press dies. Dilecto, another phenolic laminated-paper plastic, has been doing a big job in our dies, both in forming and backing up blanking and piercing dies of steel.

Among the first dies attempted with plastics were two made for a skin-stiffener or former on the leading edge of the "dorsal fin" of the Flying Fortress, Fig. 1. Sixteen of these parts are required for each ship and this number was a sufficient incentive to cut the time and cost of manufacture.

The old method was to shear as a first operation, then rout around the pattern or router block after the ma-





# d in Combination Die Set . . .

steel and plastic elements. The blanking and piercing operation is done on the left-hand die as seen in the press, Fig. 2. The forming is done in the right-hand die, as well as numbering of the part at the end of the downward stroke. These two dies are coordinated with each other, inasmuch as the last 0.007 in. of travel of the ram of the press represents the depth or penetration of the numbering stencil which completes the part after the blanking die has done its work. Every down stroke of the press produces a finished part at the rate of six per minute. In other words, four operations are accomplished with every down stroke—two in each die, blank and pierce in the first and form and number stamp in the second die.

The blank and pierce die, Fig. 3, has a base of phenol formaldehyde with walnut shell flour and wood

**. . . Time of forming and numbering a B-17 bomber part has been reduced to less than one-quarter by use of a two-step progressive die in which blanking, piercing, forming and numbering operations are performed. Plain and alloy steels, two kinds of plastics and Kirksite are used for the construction of these unusual dies.**

flour fillers. For the working part of the blanking die, SAE 4130 chrome molybdenum steel is used. It is mounted on the 4 in. phenolic plastic base. The internal stripper plate is rubber loaded. High carbon drill rod piercing punch holders and removable drill rod piercing punches are so arranged that they can be replaced, in case of breakage, without removing the die from the press. The punch plate, also made of SAE 4130, is backed up with a Kirksite block of

the same shape, and the whole punch is fastened to a plate of  $\frac{1}{2}$  in. cold rolled SAE 1020 steel backed with another phenolic laminated-paper plastic base,  $1\frac{1}{2}$  in. thick. Rubber of high durometer reading is used for strippers and is held against the punch sides with pins.

Kirksite is used for the forming die, also the punch, both of which were cast in sand. A spring-loaded knock-out plate delivers the part on top.

The forming punch is 2 in. thick

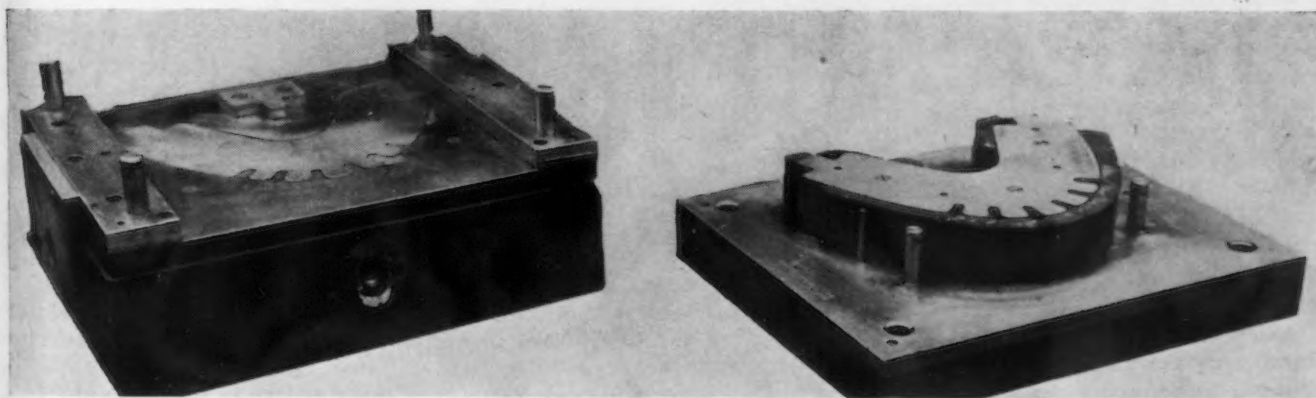


FIG. 3—Blank and pierce die for the skin stiffener shown in Fig. 1. Die at left is made up of steel parts fastened to a 4-in. plastic base. Punch at right is made of Kirksite faced with alloy steel and mounted on a mild steel plate backed with a laminated paper plastic base.

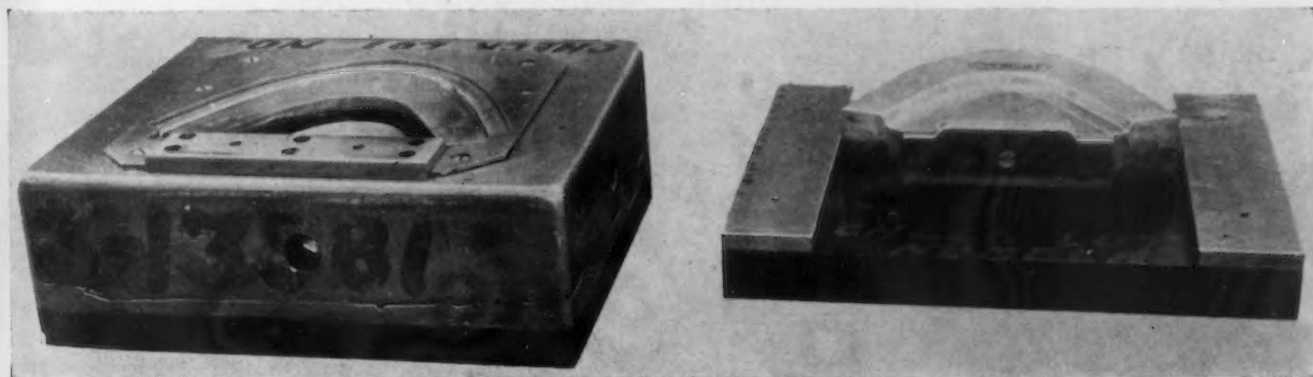


FIG. 4—Forming and part numbering die set. Die at left is made of Kirksite mounted on a laminated plastic base. Punch is also made of Kirksite and is mounted on plastic laminated paper. Nest plate, stripper plate and wear plates are of mild steel.



and is backed up with two thicknesses of Masonite, one piece of 1 in. and the base plate of 1½ in. Mild steel plates are placed on the ends of the base to take the wear. The nest plate in which the blank produced in the first die is placed is contour sawed from SAE 1020 steel as is the knockout plate mounted within the die cavity.

### Part Number Die Holder

In the development of the combination steel and plastic progressive dies that produce this dorsal fin skin stiffener, part numbering was included as the final operation to complete the part in the forming die. Being a flanged part, it presents a good opportunity to number it at the end of the forming operation.

The first attempt to number the part was successful with the regular stencils as purchased from the Mercury Metal Die & Letter Co. of Los Angeles. These were set in Cerromatrix and worked well, but due to frequent change of lot numbers a more flexible system of holding the stamps was seen desirable. Therefore, the cage shown on the accompanying sketch, Fig. 5, was developed. Such a number cage can be built in any capacity desired. It is also possible to reduce the depth to 1⅜ in. Removal of one nut on the rod allows the cage to be lifted from the die and removal of the large hollow set screw takes the one radius end plate off, allowing removal of any or all stencils which are held in line by means of the 3/16 in. rod as shown. These stencils are used the full lengths as purchased and can be easily removed from the die when and if it becomes obsolete or broken.

Since there is 2½ in. of Masonite backing up the 2-in. Kirksite punch, there is ample space for imbedding

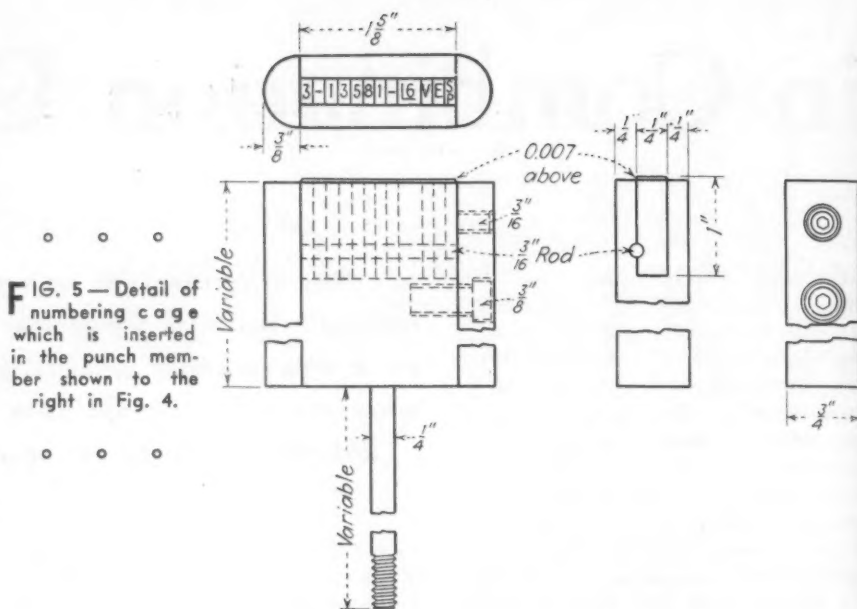


FIG. 5—Detail of numbering cage which is inserted in the punch member shown to the right in Fig. 4.

### Comparative Time Studies for Making Skin Stiffener

OLD METHOD		50 PARTS	NEW METHOD		60 PARTS
Obtain template from crib	4 min.		Procure stock from rack	4 min.	
Stock from rack	7 "		Shear into strips	4 "	
Shear parts	8 "		Set-up of dies	28 "	
Drill parts	5 "		Running time	10 "	
Procure router block	4 "		Heat treat	17 "	
Rout parts	9 "		Straighten	6 "	
Burr parts	15 "		Inspect	.5 "	
Procure form block	5 "				
Form on hydro-press	127 "				74 "
Hand finish form	43 "				
Heat treat	30 "				
Straighten	6 "				
Number part	27 "				
Inspect	5 "				
		295 "			
TOTAL		4 Hr., 55 Min.	TOTAL		1 Hr., 14 Min.

the number cage in the punch. This numbering cage has just completed a run of 850 parts and has proved very satisfactory on the 0.020 dural material of which the fin stiffener is made.

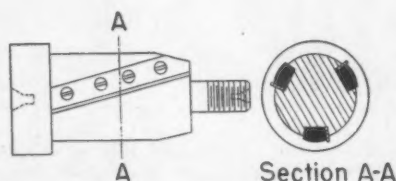
These two dies working in conjunction with each other on a 150-ton Verson press, have increased production of this one part to the extent indicated by the comparative time study data given in the table.

## Replaceable Section Arbor

**S**IMPLIFICATION of a difficult toolroom operation in the production of small aircraft motors was accomplished at a General Electric plant with a replaceable section arbor developed by F. W. Smith, one of the company's tool designers.

The life of solid stacking arbors for alignment of punchings during assembly of the stators for small, instrument-type motors was found to be very short because of wear produced by pushing 0.010-in. laminations over surfaces precision ground to very close tolerances. The sharp

edges of the silicon steel punchings cut into the arbors easily and soon destroyed their alignment properties. Further difficulty was encountered because the punchings were stacked on an 8-deg. spiral. As a result, three



lands 0.025-in. wide extending into the slots had to be machined on the arbor. As these lands wore thin, an uneven, saw-edged slot often resulted.

It was found that by machining the body of the arbor undersize and milling out slots about ⅜ in. wide in it, spring steel lands could be used. These are held in place by keys attached to the arbor by flathead screws and ground to correct bore tolerance when assembled. Replacement lands and keys are carried in stock to be assembled to the arbor bodies when wear becomes apparent.

## Spinning High Explosive Bomb Casings

**C**OMBINATION of an automatically controlled spinner and Tocco induction heating now enables the Wheeling Steel Corp. to shape large one-piece 250 and 500-lb. high explosive bomb casings in two operations.

In a battery of 200 kw., 3000 cycle Tocco Jr. induction machines equipped with inductors designed for this vital ordnance work by the Ohio Crankshaft Co., Cleveland, the casings that have been cut from heavy steel pipe are heated first for the shaping of the nose and then for the tail. Spinning follows each heating. Elapsed time

for these two operations on the 500 lb. bomb does not exceed 14 min., while the smaller bomb is finished considerably faster.

After nosing, the casing is lifted to a gravity conveyor which passes it to the next Tocco unit for tailing operations. En route the pipe goes through a cooling compartment. Then the tail is heated and spun into a truncated cone with open end—and a new bomb case is ready for the next operation.

Each of the Tocco units is a two-station machine able to use 100 per cent of its capacity. They operate on

a 440-volt hookup. High heat is confined to the specified area on the pipe, permitting the casings to be handled by operators from inductor to spinner without tongs. Inductor coils are water cooled and have a diameter sufficient to give ½-in. clearance between metal and coil. In the heating of the smaller bomb casing, a temperature of 2000 deg. F. is reached. Heating cycle for the tail of the casing is only 90 sec. while that for the nose is 2¼ min. This difference results from the fact that the nose end is heated over a greater area of the pipe than that for the tail.

**B**ATTERY of induction machines used in heating for nosing both 250 and 500-lb. bomb casings. Note two hot casings being removed from inductors. These are two-station units.



**B**OMB casings being heated prior to tail spinning. Operator has just removed a casing from the inductor. Note absence of tongs though heated end is up to 2000 deg.



# Plant Equipment . . .

## Machine Tools

New developments in automatic screw machines, drilling machines, and tool grinders are described below.

**A** NEW 12-spindle vertical-type automatic bar feed and chucking screw machine hydraulically operated, known as the Eaglesfield Verti-Matic, is announced by the Machine Tools Div. of the *C. I. Togstad Co.*, Kokomo, Ind. It is designed primarily for the fast and accurate production of drawn steel bars of various sections. Many adaptations are possible. For instance, the machine can be used for chucking operations, as the weight of the parts in the long magazine tubes automatically discharges the finished pieces. Among the advantages claimed for the machine are faster production with less manpower, simpler and faster set-up because of pre-tool set-up at the bench, and 50 per cent less floor space requirement because of the vertical construction. While the Verti-Matic provides 12 different operations for completing a part, it can also be tooled up to produce two or more parts in multiple. Feeding is handled entirely by gravity through the hollow spindles from above.

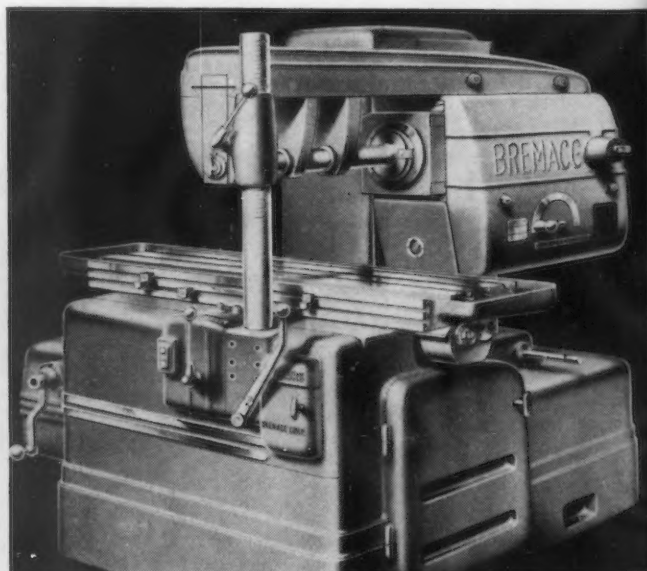
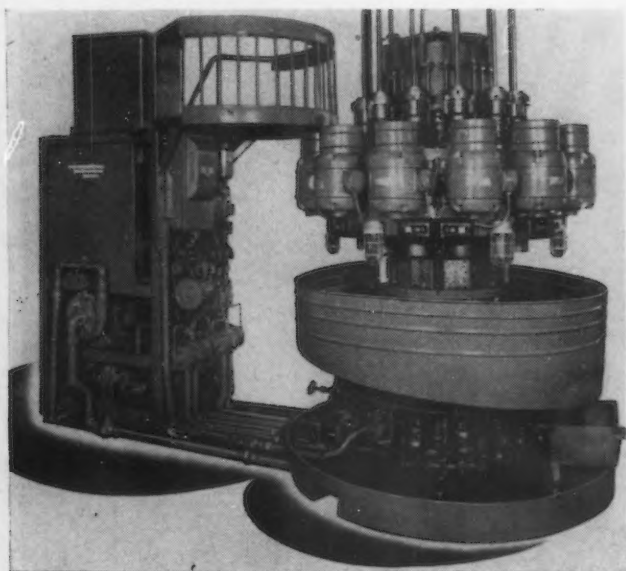
The machine proper consists of three main units: The base and column, the lower turret carrying the tool and the upper turret with revolving work spindles. The base is a large cast iron pan with a center supporting column which serves not only as a support for the rest of the machine, but also as a catch basin for the cutting fluid. The lower turret, which houses the fixed spindles with their respective end working tools, such as drills or taps, is fastened rigidly to the column. This turret also carries the stock locator and the manifold supplying the cutting fluid. The upper turret is also mounted on the column and is indexed about it. The 12 work spindles are each driven separately by a 2-hp. motor mounted on the outside diameter of the turret. Stock length is limited only by the ceiling height. Rounds up to 2-in. diameter are fed through the tubular spindles and are held by collet chucks. Directly above the lower turret are radially fed tool holders, actuated by hydraulic cylinders, the

speed of which is regulated by means of metering valves.

The Verti-Matic is operated entirely by hydraulic timing, which is adjusted by the simple setting of split cams on a shaft driven by an adjustable V-belt pulley. This timing enables the indexing to be done without shock. The control unit at the left includes a stairway and platform for access for replacement of stock. Equipment in this unit includes the cutting fluid pump, cylinder oil pump, timing valve unit with its driving mechanism, regulators, master valves and tanks. All oil lines reach the machine at floor level.

### Milling Machine with Twin Lead Screws

**P**RODUCTION of a milling machine with twin lead screws capable of down cut or climb milling on a precision, high speed production basis is announced by the *Bremace Corp.*, Detroit. The machine uses two unsplined lead screws that are so connected in relation to each other that





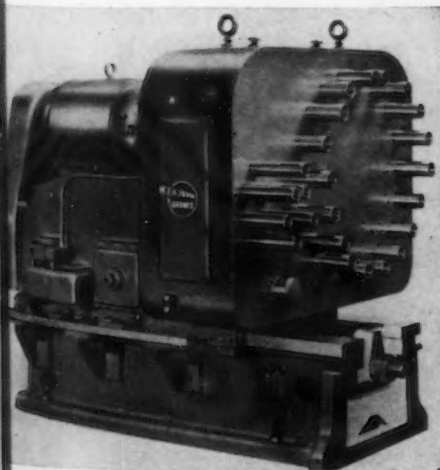
## NEW EQUIPMENT

the effective bearing surface is constantly in tension through the use of a backlash eliminator arranged outside the gear housing in the table, thus avoiding axial play in the thread shoulders of the lead screws whether the table moves with or against the cutter in heavy feed or rapid traverse. A housing is cast integral with the table, which carries all of the thrust loads.

Pick-off gears give a range of table feeds from  $\frac{1}{2}$  to 30 in. per min., with rapid traverse of 125 in. per min. The table travel is free to function as long as the main motor is in operation, regardless of whether the cutter is rotating or not. The large diameter spindle is mounted in pre-loaded Timken bearings. The main spindle, full floating, 30-deg. helical gear is mounted in precision annular bearings carried in a bridge head casting, and transmits only the torque load to the spindle. The main gear box provides two quick speed changes of high and low range, which are used in connection with pick-off gears. A heavy duty disk type plate clutch is used in the main gear box. Any danger of the operator going into the wrong speed or the wrong cutter rotation is eliminated by a safety lock which permits the clutch lever to function only for the particular job for which it was set up.

### Drilling Units

**S**PECIAL multi-spindle head drilling units have been developed by *W. F. & John Barnes Co.*, Rockford,

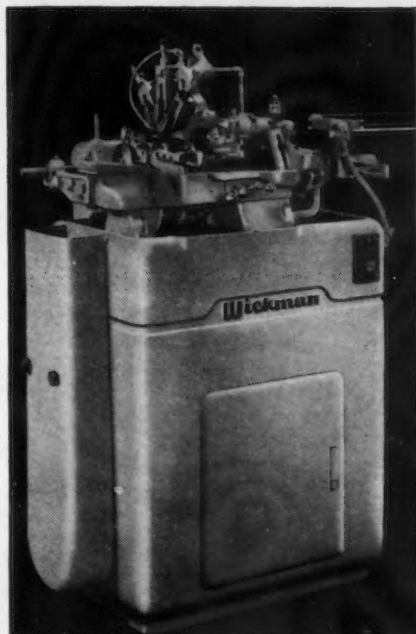


Ill., for drilling the 360 deg. revolving turret of the M-4 medium tank. The units are of standard design, one machine carrying 25 spindles and another type 24 spindles. The spindles on the 24-spindle head are arranged

with 18 spindles equally spaced about a circle and six spindles in a cluster. Both heads are equipped with anti-friction bearings, hardened alloy steel gears and heat treated spindles and shafts.

### Swiss-type Automatic

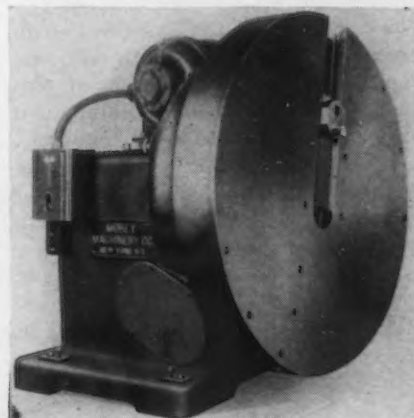
**A** NEW size Swiss-type automatic of 5/32-in. bar capacity and 1-9/16-in. turning length has been introduced by the *Wickman Corp.*, 15533 Woodrow Wilson Avenue, Detroit, for the manufacture of extremely small slender parts requiring precision limits and fine finish. The design of this machine, the No. 1 high speed Swiss-type precision automatic, is basically the same as that of No. 2



Wickman machine, which has a  $\frac{1}{2}$ -in. capacity. Firing pins, fuse parts, clock, watch, meter and aircraft instrument components and other long slender pieces offer the best field of adaptation for the Swiss-type automatic. It has a range of spindle speeds of 1500 to 12,000 r.p.m. and machine cycles from 2 sec. to 5 min. It is designed with sufficient rigidity and high enough spindle speeds to take advantage of tungsten carbide cutting tools. Small precision parts normally considered impossible of manufacture in one operation can be produced on this machine to limits of  $\pm 0.0002$  in. on diameter and concentricity, including pivot points, back shoulders, multiple diameters, tapers, bevels, etc. The principle employed in this machine is that of feeding the stock through a guide bushing past radially fed tools.

### Facing Machine

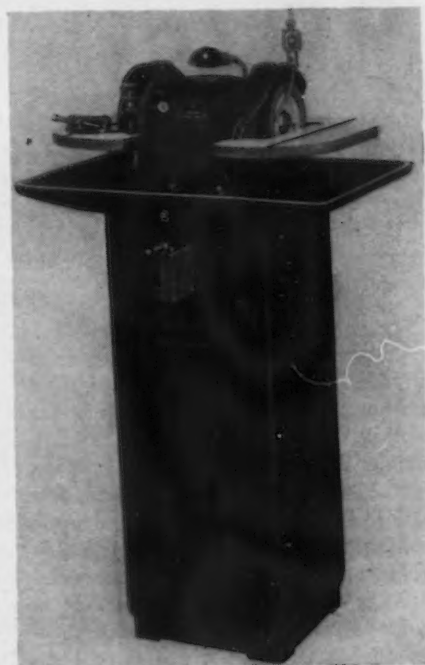
**T**HE stationary facing machine offered by *Morey Machinery Co., Inc.*, 4-57 26th Avenue, Astoria, L. I.,



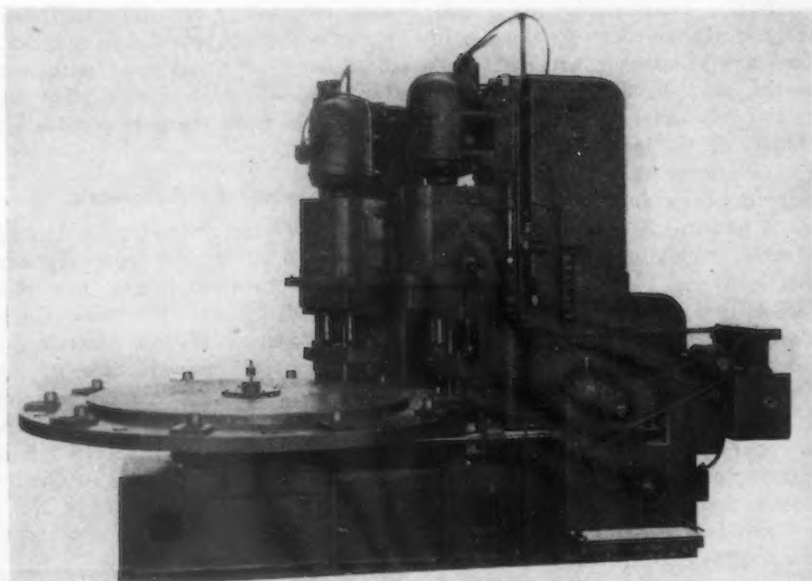
is a self-contained motor-driven unit which may be used with or without other duplicate heads set in a fixed position parallel, at right angles or at other angles to each other. Similar to that used in an engine lathe, the 1-in. sq. cutting tool may be fed away from or toward the center by means of a two-way feed, and can be quickly returned to the starting point. The machine is provided with four feed changes per revolution, in steps of 0.0115 in. A  $7\frac{1}{2}$ -hp. constant speed motor is recommended. Pick-off gears are provided to change the speed of the head to suit the work.

### Carbide Tool Grinder

**T**HOMAS PROSSER & SON, 120 Wall Street, New York, have introduced their Model AA floor type



carbide grinder, which has a heavy base, drum type on-off-reverse switch, storage compartment for wheels and tools and an indexing device permitting quick setting of the table to the desired angle. The machine carries 7-in. wheels, and the spindles run in precision ball bearings with adequate dust seals. Any combination of diamond, silicon carbide or aluminum oxide wheels can be used to permit roughing or finishing to any degree of finish of carbide, high speed steel or stellite tools. Various attachments can be furnished for the machines, such as a device for grinding drills of various sizes, and a simple arrangement for the grinding chip breakers in steel turning tools.



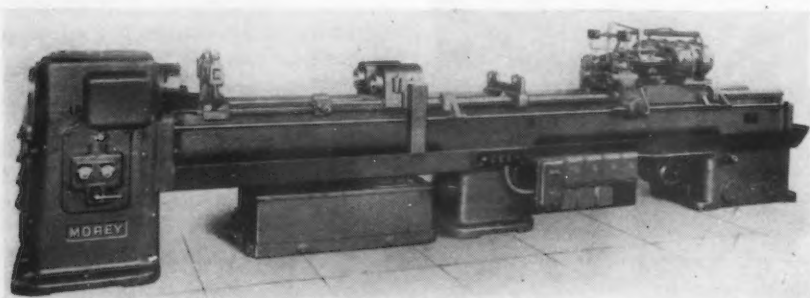
### Duplex Deep Hole Drilling Machine

**A** **DUPLEX** deep hole drilling machine, Model No. 1½, offered by *Morey Machinery Co., Inc.*, 410 Broome Street, New York, embodies hydraulic drill feed and single directional lever which controls feed and power traverse in each direction. The drill carriage is provided with automatic control which stops the motors if drills slip in either drill holder or if cutting lubricant pressure drops. Each drill is provided with a sepa-

chucked from proper locating points, the machine is manually started, and then automatically continues in cycle until all operations have been performed. The table can be indexed for different spaced holes. Cutting tools are supported in bushing brackets carried from head of each unit. The taper unit, not shown, is arranged with individual lead screw to each spindle and is driven through means of a reversing motor.

The cross slide of the machine upon which this vise rides is fed by a hand-wheel calibrated to 0.001 in. The longitudinal slide is reciprocated by an adjustable hand lever which has an 8-in. stroke. The knee upon which the cross and longitudinal slides are mounted raises and lowers by a hand-wheel calibrated to 0.0005 in. The motor specifications provide ½-hp., 1750 r.p.m., 110 volt, single phase, 60-cycle current as standard. The left side is equipped with silicon carbide cup wheel and an 8 x 14-in. tilting table, adjustable from 25 deg. below to 15 deg. above horizontal.

The new Hammond Model 6-B carbide tool grinder is of the same general construction except it is a machine which provides cup wheels on both ends, and also has large 8 x 14-in. surface ground tilting tables.



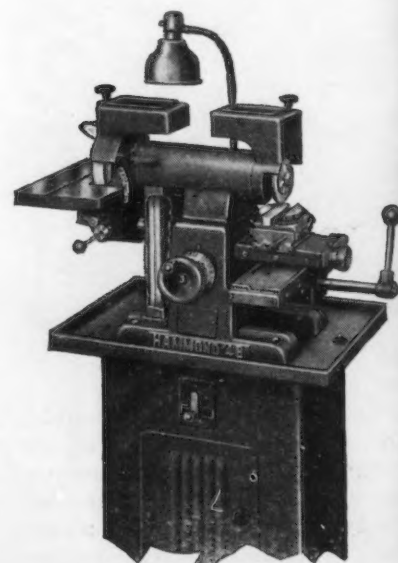
ately driven coolant pump, protected by suitable filters. The headstock is simplified and the exact work speed required is selected through pick-off gears. Model 1½ has a drill capacity of 1½ in. A larger size, No. 4½, has been designed and built for boring 90-mm. anti-aircraft guns.

### Special Drilling Machines

**BAKER BROS., INC.**, Toledo, have built three special machines for drilling, countersinking and tapping various holes on tank turret index rings. In the machine illustrated, two standard Baker No. 25-HO hydraulic feed units with multiple spindle heads are mounted on special bases around a power automatic index table. It is designed for drilling and countersinking 40 holes. After rings have been

### Carbide Tool Grinder

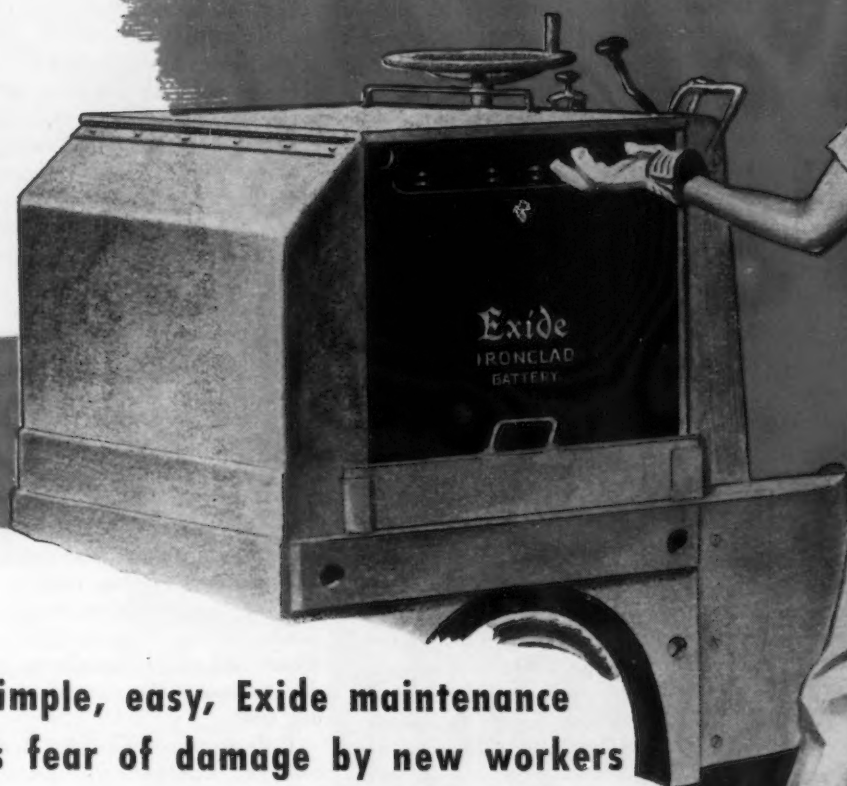
**T**WO new belted type carbide tool grinders have been announced by *Hammond Machinery Builders, Inc.*, 1612 Douglas Avenue, Kalamazoo, Mich. It is claimed the use of a multi-V-belt drive and many other features of the Hammond 4-B give finer chip breaker and cup wheel precision grinding. The chip breaker side (right) provides precision tool setting and accurate groove grinding with a diamond wheel, which may be either 4 or 6-in. diameter. Brake is provided which quickly stops the wheel when reversing on single phase current. Drip feed tanks with adjustable valves for diamond wheel grinding are integral parts of the wheel construction. A unique "Any Angle" vise of double cradle design is used.





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Industry has learned a new reason for depending on Exide Ironclad Batteries. New workers, many from offices and many of them women, are entering the industrial picture . . . calling for extensive training programs to prevent equipment damage. Exide Ironclad Batteries, by their rugged construction and ease of maintenance, simplify training and deliver surging power for our *war of movement* on the Home Front!

1

**HIGH POWER, MORE PRODUCTION:** An Exide Ironclad Battery delivers its power at high voltage to insure good hauling speeds. There's always a giant surge in reserve when an Exide powers your battery-propelled vehicles.

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# Assembly Line . . . STANLEY H. BRAMS

**• Contract cleanups after victory worry armament producers... Problems faced by prime contractors differ from those of sub-contractors.**



**D**ETROIT—Appointment of a contract termination committee by the Automotive Council for War Production calls attention to one of the most complicated problems arising out of the war—a windup of production agreements on Victory Day on a basis that will be equitable for the government, for the prime contractors and sub-contractors, and for the American public awaiting quick industrial returns to civilian production.

Earlier this year the government wrote a basic contract termination clause whose provisions ran through 16 pages of small type. The Automotive Council committee is now working on a general termination agreement of character believed more acceptable to industry.

A termination arrangement arrived at now is considered industrially as imperative if long-term unemployment is to be averted after the war. As industry sees it, there are two basic problems which will arise at war's end—the clearing of plants of government machinery, and the immediate obtaining of liquid funds in money due on arms contracts to permit ready resumption of civilian production. These problems, it is logically pointed out, can best be considered beforehand.

One proposal has been given to the government that some sort of insurance program be set up, by means of which armament producers would hand the government a percentage of their gross sales income each month to hold in a fund which would ulti-

mately cover any losses they might incur. The government, however, did not look on the idea any more happily than did private insurance companies approached earlier, and little seems to be coming of the proposal, although it may have merit.

Some idea of industry's aims may be found in the procedure being followed by Ordnance on a few contracts recently terminated. Approximations of company claims were drawn up, and payment authorized on half of this amount, the balance being subject to negotiations and auditing before disbursement. Armament producers declare that the large-scale contract terminations to come on Victory Day will require more than half the balance believed due; they say they will need three-quarters of it or more for reconversion.

**C**ONTRACT arrangement will be designed to fill, insofar as possible, a considerable gulf between two viewpoints. On the one side is the basic fact that the producer companies do not want to be responsible for liabilities which may accrue to them as a result of incompleting war work. On the other side are the armed services and the government, equally undesirous of paying for anything they will not receive. It is complicated terrain, too.

Prime contractors face one set of problems in dealing with the government on terminations, another when they deal with their sub-contractors. Sub-contractor difficulties are different and distinct from those of the prime contractors. Further, the relationship of any producer to one government contracting agency is apt to vary from that involved with another. The various provisos of the Controlled Materials Plan and other federal regulations may generally apply. Finally, contract terminations often involve agreements between war producers and non-producer individuals or companies, typified in a leasehold.

Consider the prime consumer. In many instances he is working on a variety of contracts delivered to different government branches. His plants are checkerboarded with his own and DPC machinery. He may quite likely have a bank V-loan, for which his contract proceeds are assigned. He may have leased additional space to augment his war production; quite possibly he had to secure it on a term basis, rather than

on a termination to become effective when the war ends. He has new contracts coming in all the time, on some of which he naturally expects to lose money until a backlog of experience is obtainable and black-ink operations become possible. Because of difficulty of obtaining certain types of materials, he may have purchased—with the encouragement of the government agencies involved in some instances—beyond the 60-day supply term which CMP defines as maximum working inventory.

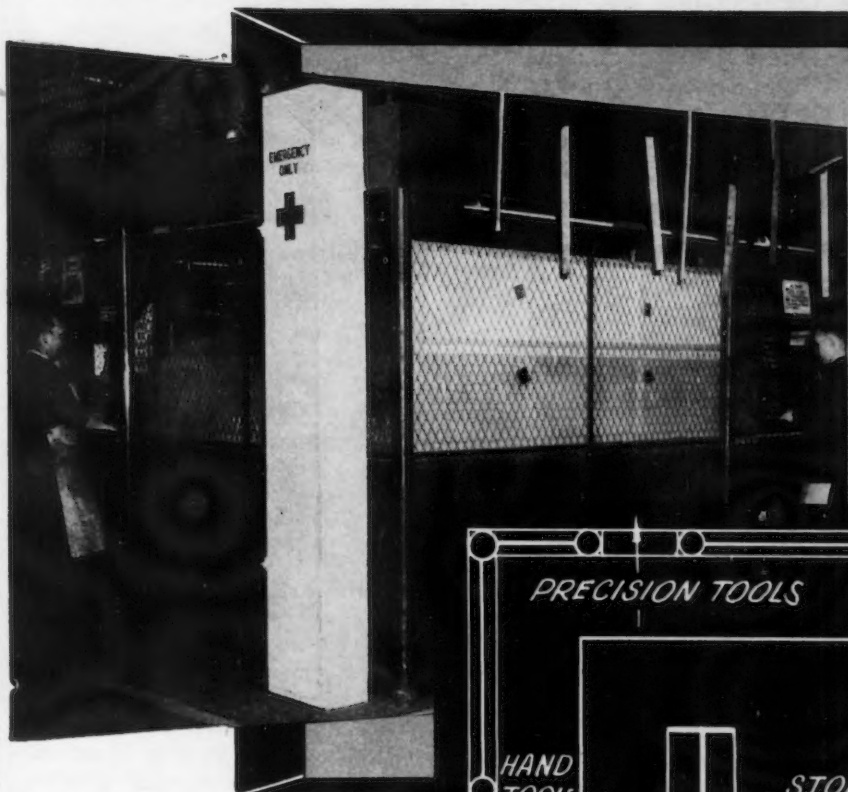
Finally, this hypothetical and yet typical producer may have multiplied his business five or ten or twenty times from its peacetime levels. He gets paid anywhere from thirty days to six months after he delivers his goods to the government; the amount of money due him at any time, therefore, is very apt to be equal to more than his entire year's gross business of pre-Pearl Harbor days.

Every one of these factors heavily bears on the Victory Day headache which will assuredly plague such producers unless the answers are figured out now.

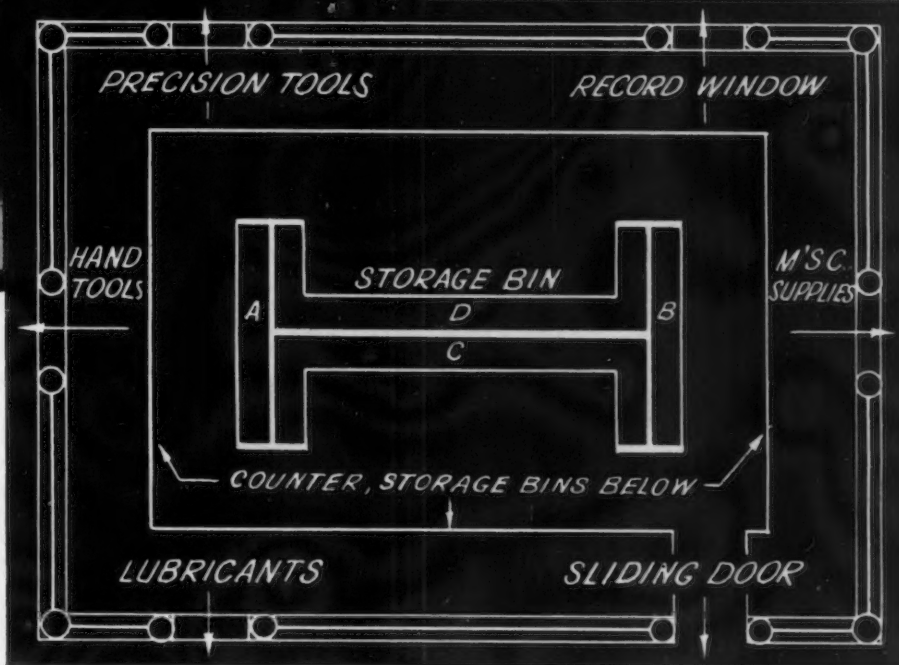
Unless some uniform method of contract termination is settled on, he may have to deal lengthily with as many government contract experts and auditors as he has jobs in his plants before he collects. He must arrive at a determination of when his responsibility for DPC machinery ends, and how soon it can be removed from his premises to make room for his peacetime production. His financial hands may be tied by his V-loans, for incoming funds will go to his bank rather than to his own accounts until assignment liabilities are cleaned up. He will be liable for unexpired terms of leases undertaken to get out war work. Termination may hit some of his contracts still in tooling or experimental stages, on which money lost at the start had not approached a make-up stage. His too-large inventories, necessary as they may have seemed, quite possibly would be disallowed in reckoning of the accounts. His working capital very possibly will be tied up until the government pays off, at the very time he wants to utilize it most, for reversions to civilian output.

**S**O much for the prime contractor. The sub-contractor has equally pressing problems and in many cases even more difficult ones because he is

# More Windows IN YOUR TOOL CRIB



This photograph shows 2 of the 5 windows in the Tool Crib of the Jig Shop at Republic Aviation Corp., Farmingdale, N. Y., plan of which is shown below.



**Floor Plan.** Storage bins for articles served at each window are under delivery counter. Note "record window," used for starting employees, assigning checks, releases, transfers.

**Suggested Plan for Reserve Storage Bin**

"A" **Hand Tools:** Drills, rivet sets, counterbores, mallets, files, etc.

"B" **Supplies:** Emery and sand paper, tapes, gloves, towels, etc.

"C" **Containers:** For carbon tet., kerosene, mineral spirits.

"D" **Precision tools:** Height gages, levels, transits, calipers, micrometers, angle plates, etc.

## LESS Waiting Time FOR YOUR MEN

HERE'S a tool crib with five windows — one for every class of tools and supplies. It's big, but the management finds that it pays big returns — by reducing waiting time for men and "down" time for machines.

Your layout may not need to be so elaborate; but careful planning of your tool crib to assure free movement and systematic order always results in longer life and more effective use of your tools.

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*Tool Conservation Begins in the Tool Crib*



largely cast as an innocent bystander in many contracting arrangements. Government policy today is basically that the sub-contractor must depend for his pay on the prime contractor. So the sub-producer is in the hands of the prime producer; and he feels none too easy about it.

Some sub-contractors are delivering goods today to prime contractors with whom they would not have done business in pre-war days. However, they

the contract, that the finally assembled product is rejected by the government because of failure to meet specifications, or for some other good reason. The sub-contractor has delivered his work and it is in good order, yet the prime contractor, under such circumstances, would receive no funds with which to pay his bills. Of course, the sub-contractor has recourse to the civil courts, but the law's slow course might be fatal at the end of

the machinery out into the weather, to make room to install its own, it risks refusal by the inspector to accept the equipment. For that matter, the subject of post-termination property care is a hazy no-man's-land in the contracts, as to who will pay for maintenance and protection of such machinery between the day of contract cancellation and the day it goes back to the government. In all likelihood the government will ultimately pay such expense, but how and when is not yet clearly delineated.

The possibility of such circumstances existing at the war's end cannot be disregarded by prudent management. And circumstances outlined above are merely a scattering of those which might eventuate.

**C**ONTRACT termination problems are complicated enough if all war work is cancelled at once; they would be complicated still more in many aspects, although simplified in others, if partial cancellations were made. A victory in Europe along with continued warfare in Asia, is not unlikely. Neither is it unlikely, then, that in such a situation half of the contracts of many of the largest producers would be cancelled, while the others would go on intact.

Victory Day in Europe then might bring a telegram from Washington to many producers ordering immediate stoppage of work on large numbers of specific contracts. Notified contractors would, in turn, have to relay word to their sub-contractors to suspend work on those jobs immediately. But the sorting out and notifying of sub-contractors might well be a task which would take several days. A large question immediately arises: Who pays for the work which the sub-contractors deliver in good faith before they have received notice of their cancellation, and after the prime contractor has received notice from the government which automatically shuts him off from further payment?

Obviously the auto industry contract termination committee has much deliberation ahead of it. The committee includes: Chairman, J. H. Marks, Packard Motor Car Co.; K. J. Ammerman, Borg-Warner Corp.; I. B. Babcock, Yellow Truck & Coach Mfg. Co.; Albert Bradley, General Motors Corp.; E. R. Breech, Bendix Aviation Corp.; W. P. Brown, Briggs Mfg. Co.; D. J. Buell, Buell Die and Machine Co.; C. C. Carlton, Motor Wheel Corp.; E. A. Clark, Budd Wheel Co.; B. E. Hutchinson, Chrysler Corp.; M. L. Peale, Republic Aircraft Corp.; and R. I. Roberge, Ford Motor Co.



**NASH-KELVINATOR SIKORSKY:** Nash-Kelvinator Corp. has completed arrangements with the United States Air Forces for quantity production of Sikorsky helicopters as shown above hovering over water. These units are designed and built by the Sikorsky Aircraft Div. of United Aircraft Corp. Although army helicopters are already being built by Sikorsky at Bridgeport, Conn., Nash-Kelvinator's construction will mark the first large scale production of these units in the world.

are so doing by government orders, as a war necessity. They fear that contract terminations may cause collapse for some of their prime contractors. The money due sub-contractors may then be taken over largely by assignees; little will be left for sub-contractors.

Or a prime contractor, in order to resume civilian production as rapidly as possible, may offer substantial concessions to the government in return for quick settlements. Sub-contractors would not sit in on any such meeting; they fear the possibility of being made scapegoats in the settlements.

Assume, however, that no such dealing from the bottom of the deck takes place. Consider, instead, the possibility, not only for termination time but any time during the life of

the war when every cent of liquid capital may be required at once to reconvert.

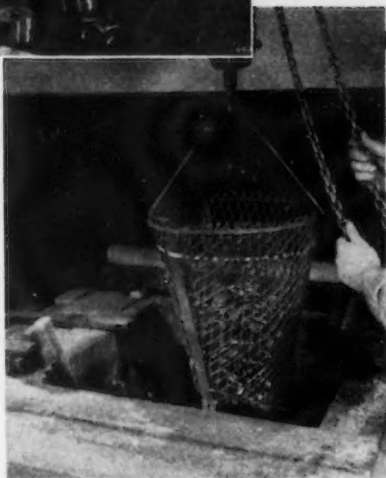
Producers will likely come up to Victory Day in many instances with their plants well filled with DPC machinery. Some few contracts have been written with the government that in the event of termination the producer has the option, if the government does not remove the machinery within thirty days or some such period, of shipping it collect to the nearest arsenal. Such contracts, however, are most uncommon and have not been drawn at all in recent months. As a result manufacturers whose plants are loaded with DPC machinery have little recourse except to await the arrival of a government inspector armed with removal orders. If the company takes the chance of moving



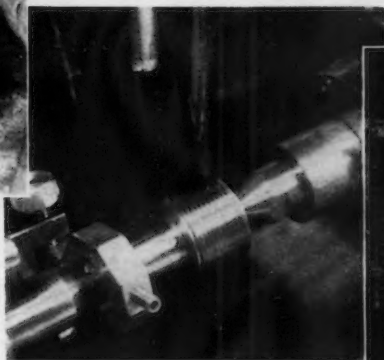
# HOW GAGES ARE *Salvaged by Hard Chrome Plating*



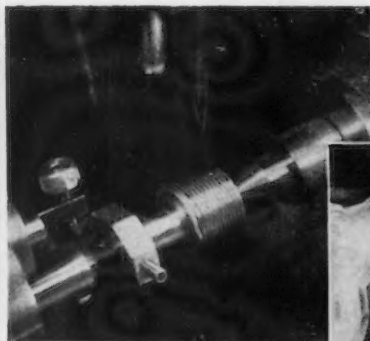
1. When gages are received they are carefully inspected. Those which are in such condition that they cannot be salvaged successfully are rejected.



2. All strains in gages are removed by drawing in salt bath for several hours.



3. Gage is ground undersize.



5. Threads are ground to specified pitch diameter and tolerance. The finest, most modern thread grinding machines are employed for this work.



6. All thread gages are properly checked for size, form and lead with close tolerance measuring equipment and accessories which are checked and calibrated in the Lincoln Park laboratory.



4. Foil and stop-off lacquer are applied in preparation for plating, the parts are properly racked and submerged in the plating bath. The plating operation is controlled by precision instruments in Lincoln Park's modern hard chrome plating department.



7. In inspection use, gages salvaged by Lincoln Park provide approximately five times the service life of ordinary gages.

While a thread gage is illustrated throughout this sequence of operations, similar processes apply to all types of gages salvaged by Lincoln Park.



## LINCOLN PARK TOOL and GAGE CO.

LINCOLN PARK, MICHIGAN

# Washington . . . ■ ■ ■ L. W. MOFFETT

• Heavy industries might be asked to buy back their war output which becomes surplus materials, thus curbing speculators . . . Another plan is to warehouse goods that are not perishable . . . Government lacks data on what it owns.



WASHINGTON—One persistent proposal for the handling of surplus war materials is to sell the goods back to manufacturers for distribution to the consumer through normal trade channels. The idea has even been put up to return metal products and other heavy industry manufactures including industrial equipment and machine tools to their source.

Protection of postwar markets is the motive, plus protection of the Treasury. It is difficult to predict what would be the attitude of heavy industries that might be asked to buy back their war output. Obvious fault in the scheme is that it would prolong unemployment in manufacturing industries. On the other hand, makers would get innumerable items which would be bought eagerly by the public. On this list would be furniture, boats, food, clothing, home furnishing and thousands of metal items whose manufacture has been prohibited for civilian consumption but which the Army and Navy continued to get. It would engage workers in distributing industries and might absorb enough men to discount the effect on employment in the manufacturing industries.

The plan would prevent speculators from buying goods at 5c on the dollar and becoming millionaires at the expense of the Treasury and the people. And since the government plans to loan money to industry for conversion to normal output, the

amount which the government would have to put up for reconversion would be decreased.

ANOTHER plan is to warehouse goods that are not perishable. The government would not release for sale more than a small proportion of the materials every year over a period ranging from 10 to 15 years. The weakness of this idea is that obsolescence in utility or design might waste millions of dollars. But, the advantages to business and to governmental realization on the material might outweigh the cost of obsolescence.

Of course, these ideas which do not contemplate the giving away, or destruction of materials, are unpopular with those who wish to serve the United Nations with continued lend-lease after the war, or who think property is better destroyed than dumped in competition on the domestic markets.

The project to send our surplus materials abroad after the war may be objected to by some of the allies which have similar commercial interest. The only way the United States will be able to get rid of excess supplies in this way is to give it to the nations who would be most likely to object. Then these other nations would be in a position to compete with the United States with its own goods in world markets.

THE O'Leary Bill (HR 2795) which was passed by the House last week is designed to efficiently provide for the demobilization of war goods but many consider that it is inadequate and that it is just as poor in its efforts to make government management more business like.

However, the Committee on Expenditures in the Executive Departments revealed some very interesting facts in its report on the bill. One is that the government has never had any real information about how much property it owns. Another is that this lack of information has prevented the Bureau of the Budget, the President and Congress from knowing accurately the needs of the various agencies. Nobody has ever known what these needs are.

The report also says that government agencies have been augmenting their appropriations by securing goods purchased by other agencies without paying for them. The natural



Wide World Photo

**AGAINST ANTI-STRIKE LAWS:** Joseph McCloy, assistant secretary of war, as he appeared before the House Military Affairs Committee to oppose anti-strike labor legislation.

effect of this is to permit the agency which transfers the property to ask for more money to replace it and the agency which receives the property doesn't have to ask Congress at all.

The way the O'Leary bill would remedy this breakdown in government finance is to give the Bureau of the Budget power to require agencies to submit reports of property inventories. When the Bureau of the Budget submits requests for funds for any agency which desires equipment in one form or another, it is being given the duty of canvassing other agencies to see if the government already owns such material. If the government does own the equipment, then there is supposed to be a transfer between agencies with payment being made by the requesting agency to the general fund of the Treasury.

THERE is a joke in all this. First these protective provisions are not supposed to become effective until after the war, unless the President





**40% Bonus  
TOOL LIFE... PRODUCTION**

## SUNOCO EMULSIFYING CUTTING OIL

**prolongs tool life...improves finish...increases production**

The longer cutting tools last on the production lines ... the more vitally needed war material can be produced for the fighting line.

The value of the right cutting oil in prolonging tool life was amply proved by a large manufacturer of war material. When using a competitive cutting oil production was seriously slowed down because of short tool life ... poor finish ... and bad operating conditions. Then he switched to Sunoco Emulsifying Cutting Oil on his Warner & Swasey turret lathes. The high heat absorbing lubricating qualities of Sunoco stopped the trouble. Results ... tool life and

production stepped up 40% ... finish on parts greatly improved.

From metal working plants large and small on America's production front reports such as these are constantly being received. Facts that prove why the majority of metal working plants flood their tools and work with Sunoco to get more pieces between tool grinds, reduce rejects, and make every man-hour and machine-hour result in peak production. Call in a Sun Doctor of Industry, let him prove the production value of switching to Sunoco in your own plant. Write **SUN OIL COMPANY, Philadelphia**

Sun Oil Company, Limited, Toronto, Canada



**SUN INDUSTRIAL PRODUCTS**

**HELPING INDUSTRY HELP AMERICA**



or a war agency head decides it should. Second, since the agencies and the President have opposed the protective provisions there is little chance for them being put into effect until they are mandatory.

The biggest reason this reform won't work is that the executive agencies are given the job of policing themselves. The Bureau of the Budget is responsible to the President. The chances that it will be able to make federal agencies toe the line are very slight since the General Accounting Office which is also set up under the Budget and Accounting Act has never been able to do it. The GAO is supposed to report to Congress.

The GAO has found that department and agency heads are a law unto themselves so far as obedience to federal financial laws is concerned. GAO is supposed to police federal expenditures but it doesn't dare do anything meaningful for fear that the agencies will influence Congress and the Bureau of the Budget into abolishing it.

**W**HEN the Budget and Accounting Act was passed in 1921, GAO was set up and given authority to establish a uniform accounting system. The system was devised, but department heads have almost uni-



Press Association

**PREPARATION FOR CHEMICAL WARFARE:** Packed with deadly vapor, these gas shells stand rank upon rank in an eastern arsenal in preparation for shipment and use, if the Axis resorts to gas warfare.

formly refused to install it. There are about 88 separate and distinct accounting systems in use by the various departments and independent establishments.

If GAO is the "watch-dog of the Treasury," it has long been toothless. The Comptroller General who heads up GAO is heard from now and then but it is usually about some minor peccadillo. Big governmental

evasions of the financial laws of the country, particularly those by heads of the executive agencies, are carefully approved without question. The trouble is that Congress has never plugged up the hole in the law which permits department heads to flout the laws. Criminal penalties which could be invoked by a revamped GAO or another congressional agency is the only solution.

## THE BULL OF THE WOODS

BY J. R. WILLIAMS



## Five Installations for Army Air Forces Awarded

• • • The War Department announced June 5:

Award of contract to Weymouth Construction Co., Memphis, Tenn., for concrete runway and taxiway at Army Air Forces installation in Caddo Parish, La., to cost in excess of one million dollars. Work to be supervised by Little Rock district office of Corps of Engineers.

Authorization for construction of aprons and runways at Army Air Forces installation in Rapides Parish, La., to cost approximately one million dollars. Work to be supervised by Little Rock district office of Corps of Engineers.

Award of contract to Chas. M. Dunning Construction Co., Inc., Oklahoma City, for construction at Army Air Forces installation in Oklahoma County, Okla., to cost in excess of two million dollars. Work to be supervised by the Tulsa district office of Corps of Engineers.

Award of contract to Corbetta Construction Co., Inc., New York, for construction at Army Air Forces installation in Tulsa County, Okla., to cost in excess of two million dollars. Work to be supervised by Tulsa district office.

Authorization for construction of runways, taxiways, etc., at Army Air Forces installation in Chaves County, N. M., to cost approximately one million dollars. Work will be supervised by Albuquerque district office of the Corps of Engineers.



*The Blanchard No. 18 is a Consistent Profit Maker on Flat Surface Work*

## "PUT IT ON THE BLANCHARD"

Large work of thin section is usually difficult to grind. Here the Blanchard method of surface grinding shows to full advantage — the work is held on the magnetic chuck and the wheel takes broad cuts over the surface at each pass. This results in greater accuracy, finer finish, and better production — the Blanchard grinds metal at all times — not air.

Above, a No. 18 Blanchard is grinding 18" x 24" steel engine end plates of thin section. .020" of stock is ground off each side to limits of  $\pm .002$ " at a production of 7 plates (14 surfaces) per hour. Note also the variety of other parts which is ground on this machine.

*The* **BLANCHARD**  
**MACHINE COMPANY**  
64 STATE STREET, CAMBRIDGE, MASS.



Send for your free copy of "Work Done on the Blanchard." This book shows over 100 actual jobs where the Blanchard Principle is earning profits for Blanchard owners.



## CHECK THESE ADVANTAGES OF BLANCHARD GRINDING

- ★ **Production**
- ★ **Adaptability**
- Fixture Saving**
- Operation Saving**
- Material Saving**
- Fine Finish**
- Flatness**
- Close Limits**



..... Especially  
valuable on jobs like  
the one illustrated.



• OPA zone plan for coast warehouses previewed . . . Production mounts at Fontana; second open hearth in production . . . Kaiser raw material policy draws minor approval . . . Shipyard steel shortage at Portland.



Wide World Photo

"TAKE OFF AT SUNSET": The pre-flight activity around an airfield in England is depicted in this painting by Charles Cundall, Air Ministry artist.

**S**AN FRANCISCO — Steel warehouse price zones for the Pacific Coast and hinterland states have been settled upon, and official price schedules should be announced officially soon to go into effect about July 15.

Because far Western industries in the past naturally have gravitated to widely separated population centers, there was no great difficulty in defining the far Western zones. It is understood that West Coast advisors to the OPA had only one major suggestion to make insofar as zone boundaries are concerned. Washington, D. C., officials tentatively had attached eastern Nevada and Utah to the San Francisco zone, despite the fact that that area is separated from the Coast trade area by several hundred miles of the hottest desert country in America, and has, in itself, constituted a distinct though minor industrial sphere since the days of Brigham Young.

Revised plans call for five West Coast zones, to be numbered 11 to 15 inclusive, with the following cities as key basing points: Seattle, Portland, Salt Lake City, Los Angeles, and San Francisco. Zones will follow the normal trade areas for which these cities are the principal centers. Seattle serves all of the state of Washington excepting southern counties contiguous to the Portland area plus the north Idaho panhandle which includes the important Coeur d'Alene

mining district. Portland is the center principally for the state of Oregon and contiguous southern Washington counties plus the western portion of southern Idaho. The San Francisco zone includes northern and central California and western Nevada; Los Angeles reaches throughout southern California, Arizona, and Clark County, the southernmost in Nevada, including Las Vegas where Basic Magnesium, Inc., and Boulder Dam are located. The Salt Lake City zone embraces Utah, eastern Nevada, and southeastern Idaho. Normal trade practice has decreed this arrangement for many years.

To the warehouses, the zone system will mean not only ironing out of minor inequalities in price brackets as in other parts of the country, but will serve as a seltzer for a mild case of distributive indigestion which has existed on the Coast ever since price control first was inaugurated for steel warehouse products. Originally Coast warehouse prices were rolled back to April 16, 1941, levels for each individual warehouse with an absolute ceiling representing published prices of trade leaders as of each center. These prices were premised upon by shipment from the East Coast of products by water other than those rolled in West Coast mills. Soon after, when water shipment became a fiction and all items imported from the East came all-rail, OPA Price Schedule No. 49 was amended to adjust for rail freight in an amount representing part of the difference

between rail and water rates from eastern points of origin.

This new price shoe pinched especially for most warehouses on hot rolled carbon steel bars for which the listed price as of April 16, 1941, represented a close price for that product as rolled in West Coast mills. With increasing demands for other products on the local mills, rollings of bars were decreased, and more and more warehouses found themselves forced to draw upon Eastern sources of supply. Thus, increased freight cost effectively consumed any margin, and famine set in. It is understood that the new zones prices will take a more realistic view of this situation and allow a price increase of approximately \$4.00 per ton for this item at San Francisco. No other flat price increases are believed to be in prospect.

Previously, district prices have been posted by OPA only for Los Angeles, San Francisco and Seattle on the West Coast. Portland and Salt Lake City will be new additions.

Under CMP, the once critical depletion which found the warehouses as bare as ballrooms on Sunday mornings has gradually improved, although no one has found any steel leaking out the rafters. Continued improvement is expected as new mill capacity takes the pressure off of facilities capable of rolling merchant items.

In the San Francisco Bay area, the Central Steel Warehouse Inventory, sponsored by WPB, is working like clockwork. Inventories of all prin-



**M**ANY industries depend upon EX-CELL-O Precision Thread Grinders for production of accurately threaded hardened parts for war work. Outstanding is the aircraft industry. Aircraft engine manufacturers in the United States are using precision thread grinders for threading parts such as cylinder barrels, crankshafts, propeller shafts, crankshaft bearing bolts, connecting rod bolts, tappet adjusting screws, etc. . . . EX-CELL-O precision thread grinders are so dependable that what formerly would have been considered very delicate threading operations on aircraft engine parts are now handled easily, with assured accuracy, high finish, production. . . . EX-CELL-O precision thread grinders grind fine threads directly from heat-treated blanks and finish grind coarser threads after heat treatment.

**EX-CELL-O CORPORATION • DETROIT**

Below: Ex-Cell-O's new catalog on precision machine tools, cutting tools, and other Ex-Cell-O precision products. Contains illustrations, descriptions, and specifications. A copy will be mailed free to any request on business letterhead. Ask for Ex-Cell-O Catalog No. 27121.



**"We finish grind these fine pitch threads from hardened solid blanks . . . on EX-CELL-O Thread Grinders!"**



**Extreme Accuracy In Form and Lead...With High Production**

At Right: One of nine styles of Ex-Cell-O Precision Thread Grinders—Style 33 Automatic.



**Precision** THREAD GRINDING, BORING AND LAPPING MACHINES • TOOL GRINDERS • HYDRAULIC POWER UNITS • GRINDING SPINDLES • BROACHES • CONTINENTAL CUTTING TOOLS • DRILL JIG BUSHINGS • DIESEL FUEL INJECTION EQUIPMENT • PURE-PAK CONTAINER MACHINES • R. R. PINS AND BUSHINGS • PRECISION PARTS

central warehouses in the region are centrally reported daily, enabling customers seeking any particular item to be directed immediately to a source at which it can be found. As well as facilitating distribution, the Central Inventory provides WPB with an actual record of steel stocks, enabling special allotments to build up stringent items. Warehouse quotas for the district, although based upon 150 per cent of stocks carried in the first quarter of 1941, fail to take into account that jobbing warehouses no longer are able to draw, in case of emergency need, upon mill warehouse stocks formerly carried here by Bethlehem and Columbia. When these mill warehouses were closed, stocks carried in the customer warehouses represented the total available for distribution, and the trade always has maintained that special consideration should be given to this factor. Now that the government actually is feeling the pulse of the inventory situation, it is felt that equitable adjustments can be made.

**T**WO open hearth furnaces now are in operation at the Fontana plant of Kaiser Co., Inc. The second furnace was tapped just one week after the Number One furnace had come into production with great fanfare. Capacity production by these two units is contributing toward the supply of ingots at the mill being built up until rolling facilities are completed.

Kaiser is enthusiastic over coke made in the company's by-product ovens at Fontana from Utah coal, and last week reported "record fuel economies" for the Fontana blast furnace.



**"POCKET-SIZE" MACHINE GUN:** Col. Rene R. Studler demonstrates the Army's newest weapon, the M-3 sub-machine gun. It fires 450 rounds of ammunition a minute, and is quickly demountable. It can be carried in a businessman's brief case.

Kaiser at present is purchasing low grade manganese ores from numerous small operators in San Bernardino, Kern, Inyo and Imperial Counties in California and at one point in Arizona. Considerable comment has been aroused in the mining industry by Kaiser's offer to purchase manganese ores running as low as 15 or

20 per cent Mn, whereas the Metals Reserve Co., purchasing for the federal government, will not accept ore under 35 per cent Mn, and then under special conditions. Kaiser also moves high grade manganese ore from lower California (Mexico).

The Fontana plant also depends upon careful iron ore preparation and charging to maintain fuel economy. The ore passes through a primary crusher at the company's Vulcan mine, about 175 miles by rail from Fontana. Both hematite and magnetite occur at Vulcan, with grade being maintained well above 50 per cent Fe, but running high in sulphur at depth. Mining is by power shovel.

At Fontana the ore passes through a secondary crusher giving a minus three inch product. The ore then is screened into three sizes: coarse, minus three inches plus three-quarters inch; medium, minus three-quarters inch plus three-eighths inch; and fine, minus three-eighths inch. Chemical uniformity and blending is allowed by stockpiling and reclaiming through the Robins-Messiter bedding system. The coarse and the medium ores are charged raw in separate layers in the blast furnace. The fine ore is sintered with coke breeze in a Dwight-Lloyd sintering machine before charging.

**I**RONICALLY, Edgar F. Kaiser, general manager of the Oregon Shipbuilding Corp. at Portland, stated recently that that yard would be forced to slow production soon because of steel shortage. Technically, the yard is a victim of the Maritime Commission's allotment program, which endeavors to distribute the steel evenly among its contractors, and Oregon's loss will be another yard's gain.

"We have been getting enough steel each month for fifteen or sixteen Liberty ships, and we have been turning out sixteen or seventeen," Kaiser explained. "Well, that procedure has caught up with us. We are hoping to get out of this spot, but it is the tightest hole we've been in," he said.

Before a National Labor Relations Board hearing, which has been probing the labor organization representation at the yard, Kaiser added that the number of man-hours per ship has been reduced nearly 75 per cent since the yard commenced operations in 1941, and that the current production schedule is the country's best, 27.2 days from keel-laying to delivery.

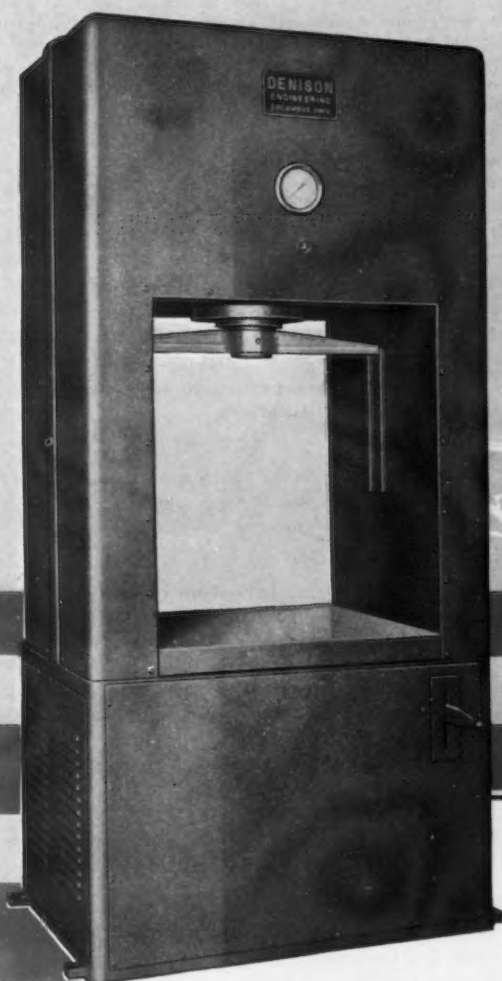
**GERMAN DEFENSE:** This picture of heavy coast artillery along the Italian coastline appeared in the May 19 issue of a West German illustrated newspaper.

Press Association





# ADEPT AS A "MOSQUITO BOAT"



## The DLOS2-50 HydroILic Press

With the adeptness and maneuverability of a "mosquito boat" streaking through heavy seas for a quick, accurate blow at the enemy, this 50-ton DLOS2 HydroILic Press is quick to get into efficient action on a wide variety of production needs. Its smooth, flexible oil hydraulic operation proves equally effective on either one-of-a-kind or continuous, production-line assembling, bending, straightening, and broaching. With almost "inch-by-inch and pound-by-pound" accuracy, the operator can control action of the ram according to each individual job requirement, *without pre-set adjustments of any*

*kind.* Yet pressure limits *can* be pre-set from 5 tons upward to capacity, and stroke can be pre-set to a maximum of 18 inches. The DLOS2-50 is a highly compact, fully enclosed unit designed for easy accessibility, space economy and operating safety. Ram control can be either by a convenient hand-lever or by electric push button. Dual controls, for maximum operating safety, are also available. DLOS2-50 is only one of many highly versatile presses in the 5- to 150-ton range in the HydroILic line. Write for complete information! The Denison Engineering Co., 1158 Dublin Rd., Columbus, Ohio.



**DENISON**  
EQUIPMENT *in* APPLIED  
*HydroILics*



# Fatigue Cracks . . .

BY A. H. DIX

## Paper Anaesthetic

The great secret of government, newly discovered by industrialists in Washington for the duration, is that to have a government job one must devise paper work to keep busy.

—From L. W. Moffett's May 27 "Washington" Section

Each of us is continually confronted with the problem of justifying his existence. If our output fails to meet a self-established par a dull mental pain develops. The pain may be removed the hard way, or it may be allayed by going heavy on record-keeping. Record-keeping is very comforting. It looks impressive; it awes visitors; in time it awes the creator himself, and best of all, it keeps people busy.

At the outset the creator of the supra-record may be tortured with doubts as to its worth, but in time those doubts will be extinguished by the reverence of the record-keepers for the record, for man tends to exalt his work, whatever it is. So the record becomes an end in itself.

With good luck a useless record may be kept for years without anyone being crass enough to ask, "Yes, but what good is it?" Even then the chances are that a few will rise to defend it, and the 99 per cent who regard it as worthless will remain politely silent. And so it will continue.

The keeping of useless records is not, of course, confined to government. It flourishes in private business, too, especially in the more "protected" corners, where the winds of competition do not blow strong enough to wipe away cobwebs.

The other day we received an \$8 subscription check from a certain railroad. On it someone had stamped a purchase number. A voucher number was written on it in ink. One set of initials indicated the price was checked, and another set that the calculations were checked.

A signature indicated that the material had been received. The check was then signed by the purchasing agent, the general auditor, and the executive assistant. For good measure the check contained three more check marks in various colored pencils, indicating other safeguards unknown to us.

All this for \$8. We need look no further for the key to full, postwar employment. Even with industry operating at a 30 to 40 per cent rate, paper work could be expanded sufficiently to create a labor shortage. Everyone would be busy, but everyone would be poor.

All our life so far we have been intending to get around to reading Gibbon's famous work in order to get the lowdown on the decline of the Roman Empire. If it collapsed under the weight of records, don't tell us. We want the satisfaction of finding out for ourself.

## Story Book War

• • • We would like to pass along this comment in *Printers' Ink* on war-time advertising by an advertising man who is now a major in the South Pacific:

... I wonder if you'd like to hear what the average soldier overseas thinks about advertising with a wartime slant.

Lay off the gallant airmen, valiant tank driver, glorious American boys bull, with drawings of Flash Gordon type guys all smiles and virility.

Quit playing up the glories of war . . . and lay off the "we are Americans we can't lose" optimism . . . Take that Life "horror" picture of the scorched Jap head on the tank and slop it all over the page. Underneath in big black letters, "Do you want your son (or brother, or father) to look like this?" Copy as follows—roughly—"Well if you don't, cut out sitting around winning the

war with your mouth, get up off your big fat backside and get to work. This picture shows a Jap but a helluva lot of Americans ended up this way and a lot more will, too, unless you quit wasting time on nothing and get going."

Of course, the major knows that there is a conspiracy among most writers of fiction and also among most writers of advertising, aided and abetted in by the armed services themselves, to conceal from the public the true face of war. War is prettyfied and glamorized. Maybe this keeps up civilian morale, but it not only depresses the soldier's morale but makes him think that the civilian is either callous or not quite bright, as instance this remark by Sergeant Al Schmit, who lost his eyesight at Guadalcanal:

"I wish I could do something to wake people up to the fact that there is a war on."

## Aptronym

• • • A North American Aviation engineer, as we see from an item on page 64 of your family favorite journal's June 3 issue, is named George Wing.

## Word-Coiner

• • • Did you mark this invention by your West Coast periscope, Osgood Murdock—"OPAcity?"

## He Would Gild the Lily

• • • A member of the staff thinks the head of our brilliant new child, *News Front* (page 47), should be adorned with a picture of a man speaking into a microphone, the idea being that the stuff is redhot.

In our fond eyes the page sparkles so vividly that an adornment would only get in the way. We think the plain heading suffices, recalling that the more potent the medicine the simpler the label.

## Lithographed Frankness

• • • We would like to air a theory of ours concerning the reason for the traditional English reticence as contrasted with our fellow countrymen's oral unrestraint.

Our theory has to do with letterheads. American letterheads tend more and more to severity and brevity—the company name and address and little more. The English, on the other hand, put everything they know on their letterheads—not only the company name and address, but also a list of the products, a roster of the officers, the telephone number, cable address, codes used, year founded, trade association memberships, and so on. Having told all, they have nothing left to talk about.

We have spent many a pleasant half hour reading an English letterhead. On the whole the English do a far better job than we do in letterhead design, and succeed in conveying a feeling of warmth that we could well copy. The only American letterhead that we would put up against England's fairest is one used by the A. N. Ellis Iron Works, 865 So. La Cadena, Route 1, Box 139, Colton, Calif. It reads unexpurgated:

Irrigation Supplies  
Including Pumps, Jacks &  
Slide Gates Flanges, & Pulys  
Well Cleaning Machinery  
General Repair Work  
of Necessary Machinery  
Machine, Blacksmith & Boiler Wk  
Electric, & Acetylene Welding  
Roler Wedge Tight Water Gate  
Machinery Merchants

Mining Machines Built  
Gas Savers Made to Order  
Trailers and Hitches Made  
Invidid Derrick for Sick  
Pattern Making, Wood, Metal  
Gasoline Engine Expert  
Pass. Busses Will Stop  
Defense Work Taken  
For Sale, 35 H.P. E. Motor  
3, 4, 5, 6 Hor. Vert. Cent. Pumps

## Puzzles

Last week's sextette lines up thus: Arthur and Cynthia, Bernard and Barbara, Charles and Ann.

We are getting down toward the dregs of our puzzle book. This ought not to take you more than seven minutes:

A king ordered a crown weighing 60 ounces, to be made of gold, brass, tin and wrought iron.

The gold and brass together formed 2/3rds, the gold and tin together 3/4ths, and the gold and iron 3/5ths. How much of each material did the crown contain?



This six year old Cyclone averages over 1500 tons of tempered parts per year at a maintenance cost of only 1c per ton!

## 6 year old **CYCLONE** averages 29½ tons of tempered steel per week!

IN JULY 1937, the gas fired Cyclone, shown above, started to turn out uniformly and accurately tempered parts at the rate of 9850 lbs. per day. The work was of various kinds and heated at different temperatures. Today, after almost six years of continuous service and the production of over 9,000 tons of work, this 22" diameter by 26" deep Cyclone is as efficient as the day it was installed.

### 1¢ PER TON!

Even with heavy production schedules, all of the replacement material, over the span of years, has been only \$93.77, or 1 cent per ton average.

The Lindberg Cyclone Tempering Furnace, like all Lindberg equipment, is built to "take it." Before it is ever announced to the trade, each furnace has to pass the grueling gauntlet of several commercial

production lines. It is worked on by heat treater and engineer alike until it can be honestly okayed as the "practical furnace for the practical heat treater."

### BULLETIN 52 AVAILABLE

Bulletin 52, on the Gas Fired Cyclone Furnace, shows the wide range of sizes available, a cross section view showing the famous Lindberg recirculating principle, construction features and pictures of Cyclones at work on a wide variety of work. Bulletin 52 will gladly be sent on request. WRITE TODAY!

**LINDBERG ENGINEERING COMPANY**  
2452 WEST HUBBARD STREET • CHICAGO

# LINDBERG FURNACES



**SUPER-CYCLONE** for hardening, normalizing, annealing, tempering  
**CYCLONE** for accurate, low-cost tempering and nitriding  
**HYDRYZING** for scale-free and decarb-free hardening



# Dear Editor:

## INCENTIVE PLAN

Sir:

Referring to your May 6 editorial on incentive plans, "Three Million More for Uncle Sam," and your proposed solution that is "as simple as the nose on your face."

We have an incentive system in our shop for the past several years, which has consisted of piece work rates and premium. The latter has applied to work other than piece work and is based on allotted hours per job. Our men have done well. Am of the opinion your idea would be much more workable if we could have the same choice of labor as was available before and shortly after Pearl Harbor and before absenteeism became conspicuous.

Incentive has been suggested as one of the cures for absenteeism. It has been my experience that incentive pay is largely to blame for absenteeism.

It would seem that you have fallen for the somewhat prevalent idea that all men are equally endowed with the spirits of ambition and thrift. For answer we have but to explore absenteeism and the chucked opportunities to cash in and lay something aside for the let-down which is ahead. Let us also explore the many thousands of defaults in income tax payments.

Reducing piece or premium rates is taboo in our shop; yet the number of "lost hours" has been greater since January 1 than in any previous corresponding period. The more our men make per hour the better we like it because it means increased production and reduced overhead.

The men of seniority in our shop remind me of good "road horses"—always plugging away. I have great respect for them. However, it is vastly different with the class of labor we have had to take during the past fifteen months—the class that remains on the job one day and up. Perhaps Cincinnati is at a geographical disadvantage in being too close to the other side of the Ohio River. A survey of the labor situation in southern Ohio would be illuminating to many.

The idea of legislative freezing of established piece rates for the duration can also stand a bit of exploring. As I understand, Unions do not permit downward revisions of piece rates—not even where a rate has been excessive because of an honest clerical error. Clerks and timekeepers cannot wrestle with figures all day long without making a mistake now and then, but the Union does not excuse them. However, when a man in the shop makes a mistake, the company pays for the spoiled material, also pays the man for correcting his own mistake, even to time and a half.

If everyone had the same appreci-

ation of opportunity and of the value of thrift, there would not be the present concern over the sale of War Bonds, nor of financing the war.

J. C. ENDEBROCK

800 Ludlow Ave.,  
Cincinnati, Ohio

## NON-FERROUS PROBLEM

Sir:

I have a problem which, if you do not know the answer, perhaps you can tell me how and where I can find it.

We operate a non-ferrous foundry and machine shop and are disturbed by the accumulation in our stores of miscellaneous parts. In addition to the production of our regular line, we do considerable jobbing work, and the parts of which I speak fall in the latter category.

In the production of any article, we increase the size of the order by a safety factor to insure having sufficient pieces to fill the order. If the job goes well, and there are few defective pieces, we are faced with the problem of what to do with the excess. Shall we put them in stock, trusting that we shall get a repeat order one day, or shall we throw them back into the furnace and so rid ourselves of the troubles concomitant with carrying them on our records? Though the excess on any job may not represent a considerable amount of metal, when all the jobs are taken into account, I believe the idle metal may be measured in tons.

What do other manufacturers do? Do they go to the trouble of calculating the cost of storage, the cost of entering the item in their records, interest on the money invested, insurance, rent, etc., to determine whether or not storage is economically justified for any length of time?

GEORGE M. ONKEN

Kitson Co.,  
1500 Walnut St.,  
Philadelphia, Pa.

● We believe, but do not know for certain, that jobbing foundries rarely carry extra pieces of any job. It is our opinion that the general practice is to remelt "overs" as soon as the order is filled. If we are wrong, we would appreciate it if jobbing foundry readers would set us right.—Ed.

## COMPOSITE STEEL PRICE

Sir:

Apparently you have revised your composite prices of finished steel in the issue of April 22. We will appreciate it very much if you will send us a tabulation of new figures as far back as the revisions were made.

WALTER B. ROYSE,  
Vice-President

Crandall, Pierce & Co.,  
1600 Bankers Bldg.,  
Chicago, Ill.

● Revised composite prices are: 1942, 2.26190c a lb.; 1941, 2.43078c a lb., as

pointed out on page 90 of the April 22 issue. The finished steel price index has been revised for 1941, 1942 and 1943 because these years have been abnormal as far as the price of steel products consumed are concerned.

A tentative index based on expected consumption of finished steel products for 1943 has been set at 2.25513c a lb. When actual data on the consumption for the year are available the current quotation will be corrected.—Ed.

## EUTECTIC WELDING

Sir:

We have a specification for some experimental work on which there is to be some special welding.

Will you please give us an explanation of Eutectic Welding and instructions for same, and also for anodizing metal.

M. L. BRYAN,  
Secretary

Bryan Engineering Co.,  
Troy, Pa.

● Eutectic Welding Alloys, Inc., 40 Worth St., New York, has recently prepared several bulletins on the application of its low-temperature brazing and welding materials. We suggest that you write for these bulletins.

The term anodizing refers to the surface treatment of aluminum to prevent oxidation. It is a de-plating process inasmuch as the work itself becomes the anode in the plating bath and metal is thrown off rather than put on. At the anode nascent oxygen is released. This immediately attacks the metal surface and forms extremely hard oxide film. The treatment is widely used in the aircraft industry, and in bygone days was used to treat aluminum automobile pistons. For specific information on the subject, write to the Aluminum Co. of America, Gulf Building, Pittsburgh.—Ed.

## GERMAN STEEL

Sir:

In the Nov. 26, 1942 article on "Steel Chromizing" you list (on page 53) a table of German steels suitable for this process. I am unable to find out the chemical specifications for these steels, even after considerable research. Will you please inform me concerning these analyses or direct me to the proper source of information.

FIELDING S. ELLIS

1224 Astor St.,  
Norristown, Pa.

● We understand that Wolf Flatow, 43-B South Coeur d'Alene St., Spokane, Wash., has a list of German steel specifications up to 1940. He may be willing to furnish you with photostats at cost.—Ed.

## STANDARD STEEL CHART

Sir:

Your May 6 issue contained a Standard Steel Chart which we found very useful. We should appreciate your sending us, if possible, two additional copies for use in our tool room.

ELI D. GOLDSMITH,  
Purchasing Agent

Unique Specialties Co.,  
65 Bleecker St.,  
New York

● Copies are being mailed you, price 25c each.—Ed.



# Wheelabrator Speed Cleaning Makes Every Minute Count!

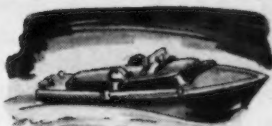
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# AMERICAN

FOUNDRY EQUIPMENT COMPANY

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# This Industrial Week . . .

- **Byrnes Demands 1,000,000 Tons More Steel**
- **Labor's Cooperation with New Drive Vital**
- **Wilson's Figures Add Emphasis to Campaign**
- **Steel Ingot Output Snaps Back to 97.5**

**T**EMPERATURES have been rising during the past 10 days in the steel industry. Dapper James F. Byrnes hardly had settled in his new OWM office chair when he expressed the view that greater steel production is imperative because of the speed of the war program. Down the line passed the order for action. Soon telegrams from C. E. Wilson of WPB began arriving at steel company offices asking for much data.

Somehow, 1,000,000 more tons of ingots must be produced in the third quarter of this year, said Byrnes, and in the fourth quarter an extra 1,000,000 tons must be made. It was found allotments of rolled steel under CMP for the third quarter were around 1,000,000 tons in excess of probable rollings.

The military forces, ahead of their schedules and facing crucial campaigns, are expected to be the chief beneficiaries of the greater production, which will consist mostly of carbon steel. However, the farm equipment industry already has been allocated an increased allotment of 300,000 tons of carbon steel (a grant which surprised some military men) and the railroads, Lend-Lease and other accounts are expected to benefit.

To help attain the new goal, the steel industry's expansion program will be given fullest priority assistance, which it has not always had previously. Controls over inventories and scheduling will be tightened; alloy steel production in open hearth furnaces probably will be cut back, and allotments which are said to total around 17,400,000 tons of rolled steel may be trimmed.

**T**HESE steps will be valuable but the biggest contribution must come from steel industry labor, in the opinion of seasoned steel executives. All companies have been making and processing as much steel as conditions would permit and have been exchanging materials with each other. Now labor's help is needed to curb absenteeism during the Summer; to prevent minor strikes, and to offset through extra daily effort the manpower and coal strike drains.

Byrnes' move intensified the wonder of many persons over where all the tremendous quantities of

## Russia Gets 725,000 Tons of Steel

• • • In addition to thousands of tanks, planes, motor vehicles and guns, the United States has provided Russia in the 19-month period ended April 30, 1943, with 725,000 tons of steel and steel products; 145,000 tons of copper, brass, nickel, molybdenum and other material, 60,000 tons of aluminum and duraluminum and 32,000 tons of zinc. Soviet railroads have received 85,000 tons of rails and accessories and 27,000 tons of other equipment. These figures are from the report of E. R. Stettinius, Jr., Lend-Lease administrator.

steel are going, particularly in view of the recent cutbacks in some phases of the armament program. Other persons asserted the most significant aspect of the Byrnes maneuver was the fact CMP, which has failed to provide the steel that the various Claimant Agencies felt they needed, has been thrown out of line as it pertains to steel, because OWM has taken over allocations. Even before Byrnes took his sudden action, Washington authorities realized that their biggest challenge was getting CMP on a workable basis, and to this end field representatives recently have been soliciting the steel industry's reactions and suggestions. Now, with allotments greatly increased by Byrnes, a mere readjustment and upping of CMP tonnages for third quarter will not properly correct basic wrongs which might exist in the plan.

**P**OSSESSING vast ingot making capacity which it has operated at close to 100 per cent for many months, the steel industry has been impeded by insufficient blooming mill capacity, annealing furnaces, hot topping equipment and other processing facilities. As to the expansion program which the industry has been pushing as vigorously as possible in the face of obstacles, completion dates of full facilities have been sheer guess work. Blowers for blast furnaces, cranes, various auxiliary equipment have been particularly difficult to obtain, through no fault of the makers. The possibilities of shortages of coke and manpower have lurked ominously in the background recently.

The advent of warm weather invariably means production losses sometimes as much as four to seven per cent in some steel plants, due to the effect of the heat upon the workers' efficiency.

Although the blame for the lagging steel expansion program has been shifted from one group to another and back again, probably no group could be reasonably charged with the complete responsibility for this retardation. The ill-fated Priority System was primarily responsible in the beginning for the

## News Highlights in This Issue

New Steel Demand . . . . .	95	CMP Record . . . . .	105
Steel for Farm Tools . . . .	99	Ratings Dropped in Steel .	144
Ore Vessel Need . . . . .	99	Warehouse Sheet Change . . . . .	144
Plate Requirements . . . . .	100	WPB Form Numbers . . . .	148
Coal Strike Latest . . . . .	101	Warehouse Price Zones . .	156
Raw Material Use . . . . .	101	New Farm Order . . . . .	158
Wave of CMP Changes . . . .	104	Machine Tools . . . . .	162



lack of coordination in piecing the important parts of the steel program together. The urgent needs of the armed forces were continually upsetting manufacturers' schedules on items needed for expansion projects.

ADDITION emphasis to the new campaign for more steel were figures cited last week at Detroit by Mr. Wilson, vice-chairman of WPB, who said arms schedules call for an increase in total production of 24.5 per cent next year as against 1943. The monthly average in 1944 also is slated to be above the peak in 1943. Output in aircraft in 1943 will double 1942 in its volume, he said while tonnage is slated to nearly triple that of 1942.

Tank program reductions, he said, were reduced because "an Ally requiring large quantities" has developed its own production. Presumably this is Russia.

Included in the new armament plans is a huge program for the manufacture of large guns, according to appropriate authority.

Other trends of the week in the metals and metal-working industries include:

Ingots from the Kaiser West Coast steel mill have been piling up due to the lack of rolling facilities and it is reported some may be shipped for export under Lend-Lease, with the balance going to an Eastern mill for rolling into plates.

The railroad steel situation appears more confusing than ever. Some authorities expect shipments in July will be very light due to the lateness in issuing allotments for the roads.

MACHINE tool builders will be kept occupied, according to government officials, who point out that current orders are 50 per cent of shipments and the average backlog is about five months, while the transfer to new work by individual machine builders is reported progressing well.

Tung oil, widely used as an impregnating material for magnesium castings, is reported close to the bot-

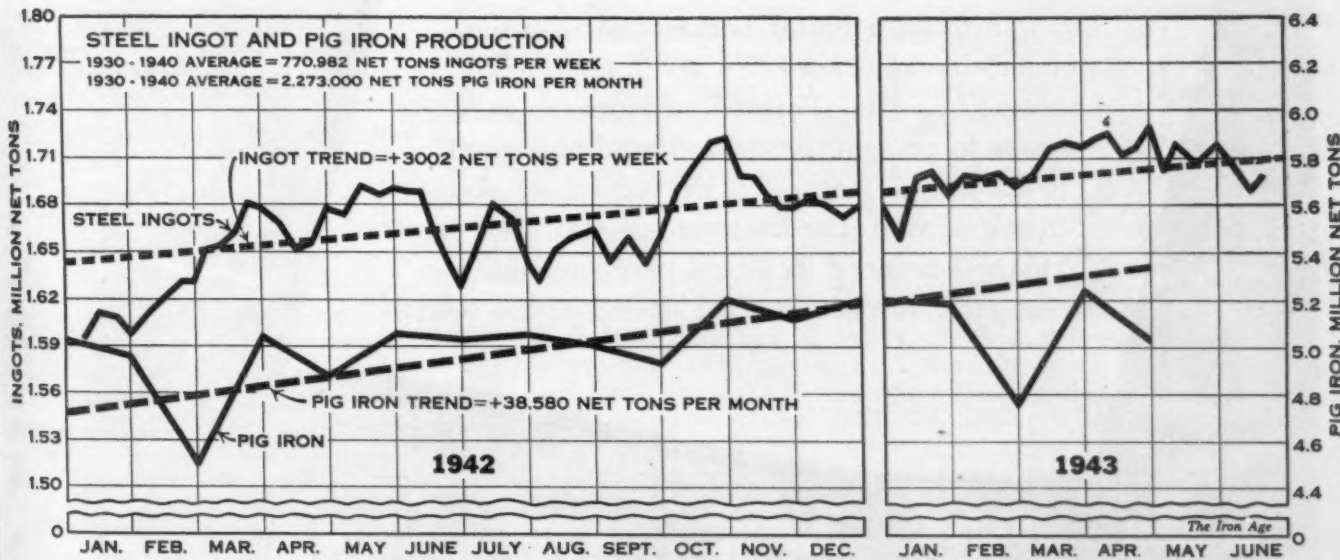
### "Numbers Game" on Vast Scale

• • • WPB has decided to renumber all of the current and future report and application forms for all industries. Good old PD-99 will hereafter be known as WPB-180, and so on.

All form-files must now be revised to a new number sequence; all standardized flow charts of reporting schedules, etc., must be revised, and you must once again tackle the job of memorizing a whole new routine. Four months has been allowed for the changeover. (See story and list of 600 forms already converted on p. 148.)

tom of the supply barrel in this country. With imports from China all but choked off during the past year or so, magnesium foundries have been drawing steadily on the national reserve and have about used it up. One of the largest magnesium foundries expects to shift this month from tung oil to a plastic substitute. At least two plastic substitutes have been developed, have gone through experimental stages, and will be introduced in production work this summer.

STEEL ingot production this week snapped back to 97.5 per cent of rated capacity from last week's revised rate of 95 per cent. Pittsburgh operations jumped 10 points to 100 per cent and in Philadelphia steelmaking increased half a point to 93 per cent. Wheeling gained four points to 89 per cent while Birmingham rose three points to 102 per cent and Detroit was up seven points to 100.5 per cent. Eastern district operations increased 12.5 per cent to 113.5 per cent. The operating rate at Youngstown fell one and a half points to 94.5 per cent and that of Cleveland dropped one point to 96.5 per cent. Unchanged from last week were Chicago at 97, Buffalo at 104.5 and St. Louis at 99 per cent.



Steel Ingot Production by Districts and Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	S.Ohio River	St. Louis	East	Aggregate
June 10.....	90.0*	97.0	96.0*	92.5	97.5*	104.5	85.0	99.0	93.5	102.0	102.0	99.0	101.0	95.0*
June 17.....	100.0	97.0	94.5	93.0	96.5	104.5	89.0	102.0	100.5	102.0	100.0	99.0	113.5	97.5

\* Revised

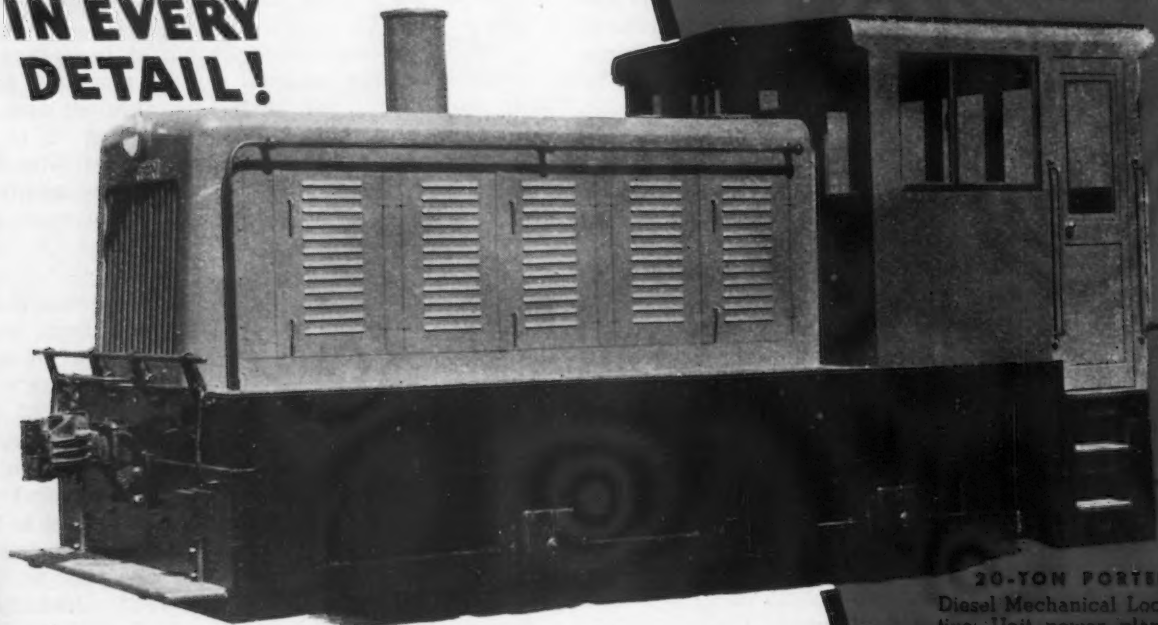


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**JAMES F. BYRNES**  
*Demands More Steel*

*News  
of  
Industry*

## Steel Industry Under New Pressure To Produce 1,000,000 More Tons Of Ingots for Third Quarter

• • •

### Washington

• • • Responding to a must order from the White House, WPB is starting its drive to increase steel production by 1,000,000 ingot tons in the third quarter. The sudden demand for stepping up output came directly from War Mobilization Director James F. Byrnes at the first meeting of OWM on Tuesday of last week which the President is said to have attended. An extra 1,000,000 tons also is contemplated for the fourth quarter. Pressure for the increased supply of steel came for the third quarter from the armed forces and is attributed to the intensified military activities in the European area.

While it is said that most of the enlarged requirements will be for the Army and Navy, greater distribution also will be made for lend-lease, the railroads, Maritime Commission and the farm machinery industry. The first to get a definite increased allotment for the third quarter were the farm equipment manufacturers. They were allocated 300,000 tons of carbon steel by WPB.

The great bulk of the increased third quarter production will consist of carbon steel. Several ways to step up the output have been devised. One large portion of the output is expected to come from stimulation of the expansion program. To this end the green light has been given the steel

industry on priorities. Lack of material has been the chief reason for the lag in the program. A considerable number of open hearth furnaces, it is said, can be quickly put into production once

material for their completion is supplied.

Another principal way of increasing output on which much dependence is being placed is through encouragement of management—labor cooperation and a campaign for this purpose is being worked out. It was inaugurated on Monday when WPB Steel Director H. G. Batcheller held a conference with CIO President Philip Murray. Conferences also have been held with steel executives. Meanwhile WPB Vice Chairman C. E. Wilson sent out telegrams to the steelmakers inquiring about the amount of steel that they can make and roll beyond the volume they can produce in their own plants.

Tighter scheduling control is another proposal to increase output, and this will entail a readjustment of the CMP whose original third quarter allotment evidently has been upset by the order for the 1,000,000-ton increase.

Again there are two other important plans to step up production. One of these is by cutting back alloy production in the open hearth furnaces and converging more heavily on carbon steel. On the average it takes about two-thirds as long to turn out a carbon heat as it does an alloy heat. Also, the ingot cropping of carbon steel is about 30 per cent while the average cropping from the alloy ingot is estimated at 40 per cent, though there is a wide variance. Mr. Wilson said that it was expected to get 150,000 additional tons of carbon steel by reason of this conversion.

An equally important plan to build up the third-quarter steel supply is by closer control of inventories. This is a subject that has caused considerable dispute between WPB and claimant agencies. Contention is made that not only are inventories in the hands of some agencies unbalanced but inflated as well. It is also expected that some of the already third quarter steel allotments of 17,400,000 tons of rolled steel will not actually be required.

WPB officials are of the opinion that with the plans under way put into effect, the added 1,000,000 tons will be produced in the third quarter. There is one important qualification. This is the threat of a coal strike. Should this develop, the industry will

• • • On the pages following this article are numerous stories concerning specific factors which have bearing upon the whole problem. Below are a few statistics of interest. Tables and charts covering the steel expansion program appeared in this magazine May 27, page 85; June 3, page 90; June 10, page 115.

(Net Tons)

Steel Ingot Production in First Five Months of 1943.....	36,839,811
Annual Steel Ingot Capacity as of Jan. 1, 1943.....	90,288,860
Total Annual Capacity Expected When Expansions Are Completed .....	97,400,000
Commonly Mentioned 1943 Ingot Production Goal.....	92,000,000





**CHARLES E. WILSON**  
*Studies Existing Facilities*

soon go flat on any sizable production, to say nothing of being unable to produce an added tonnage over present allotments.

It was said that there is no concern over either the ore or scrap supply for the third quarter.

Some Washington observers expressed wonder publicly last week whether another "tug-of-war" might be shaping up between the armed services and WPB. The question even was advanced in at least one newspaper as to what will happen to WPB Chairman Donald M. Nelson, and it was said much will depend on the attitude of Bernard M. Baruch, recently appointed production adviser to Byrnes, and upon the attitude of Frederick Searls, Jr., who has been appointed by Mr. Byrnes apparently as an adviser on production programming.

#### *Chicago*

• • • Reports of a deficit of 1,000,000 tons of steel in the next quarter are looked upon skeptically here. It is suggested that in making this forecast, no consideration was given to the effect of cancellations. One mill here reports that recent cancellations have enabled it to put into its rolling schedules new tonnages exceeding its prorata share of this million ton deficit.

Over the past few weeks or so, changes in the scheduling of war material production have been tumbling upon one another. Typical of this is the cutback in armor plate production reported last week at the Gary works of Carnegie-Illinois Steel

Corp., which is expected to cause the layoff of 1400 men by the end of this week. Nor is this the end of adjustments in armor plate production. It is quite likely that further changes, both up and down, will occur in individual plants as the services attempt to obtain the most efficient distribution of their armor plate requirements.

A short time ago, a large bomb program here was cut back. Later one of the services stepped up its landing barge program, while another has placed order for a number of sizeable oil barges. On top of this is the proposal under discussion to expand production facilities for 100 octane gas. Still in the background are rumors of a pending program of large size which will cause further changes in steel and component scheduling.

While individually, these changes appear "confused" as a whole, they form a pattern of stressing assault weapons such as barges and aircraft, and a de-emphasizing of some types of land equipment, part of which has been overproduced and is backing up for lack of adequate shipping.

This constant shuffling has an accompanying effect upon activity in the various steel products. For example, standard and heavy structurals are now much more active than a month ago.

Mills here are generally making good headway in adopting the 48-hr. week. One large steel producer reports that from 85 to 90 per cent of its personnel is now on the 48-hr. basis. However, the real problem is in the remaining 10 to 15 per cent. It appears inevitable that industry must be given considerable leeway in handling this marginal group, if hardships are not to be worked on labor and if labor wastage is to be avoided.

On top of the backwash of the coal strike, the 48-hr. week and numerous flash strikes, one Midwest steel company has had more than 40 work stoppages since Mid-April.

By speeding up new projects, by conversion of furnaces back from alloy steel to carbon steel, by releasing idle and excess inventories and by putting on a special drive, the WPB expects to get an additional million tons of carbon steel from the industry during the third quarter of 1943. This million tons, if it can be achieved, will be added to the allocations already made to the Claimant Agencies for this quarter. The special effort to obtain more steel and to



**H. G. BATCHELLER**  
*Spurs Steel Industry*

stretch the war program at this particular time is based upon a special request by the Army, Navy and Lend-Lease.

#### *Cleveland*

• • • Down for more than a year because of the shortage of re-rolling rails, the Moline, Ill., re-rolling mill of Republic Steel Corp. will go back into operation soon. While the supply of re-rolling rails does not appear to have improved over what it was a year ago, the company will put the plant back on rolling shapes, concrete bars, and and other similar products.

**PHILIP MURRAY**  
*Labor's Help Is Vital*





## Industry Aware of Production Problems

### Pittsburgh

• • • Washington demands that steel output be increased substantially during third quarter bring up the fact that practically all large steel companies for months have been making and processing as much steel as conditions would permit.

Many large companies in this district alone have for the past year and a half or more exchanged material with each other so as to obtain the maximum finished steel production. One company's ingots have been repeatedly processed by another company and cases where billets, blooms and slabs have been handled by more than one company are numerous.

The one bottleneck to a greater finished steel production has been and still is blooming mill capacity. There is relatively little extra blooming mill capacity available at the present time. For this reason talk about shifting billets, blooms and slabs to those companies which appear to have excess finishing capacity is beside the point, as no means exist for breaking down ingots which may represent an increase over present ingot output.

The steel industry has recognized for some time the production problems which it was bound to encounter this summer and fall. In order to meet previous demands, blast furnaces and open hearth furnaces have been

pushed to the hilt and now find themselves in a heavier repair cycle. Warm weather with its heat exhaustion cases and its drop in efficiency per man normally affects raw steel output to an extent ranging from four to seven per cent depending upon the severity of the weather.

The imposition of the 48-hr. week in the steel industry may find an increase in absenteeism among the more difficult vocations in the open-hearth and blast furnaces. This fact, coupled with possible manpower shortages, presents problems not only for increasing production but also for keeping it where it has been.

Washington reports that some open hearths which have been making alloy steel will go back to carbon steel, indicate that the alloy situation, through the efforts of the industry, is in better shape than it was several months ago. However, much of the carbon steel today requires almost as fine treatment as alloy steel.

Obviously steel companies will bend every effort as they have been, toward establishing new highs in steel production and finishing. However, the failure to reach goals set by Washington officials should be interpreted in the light of what has been done, the saturation in blooming mill output, the effects of hot weather, the manpower shortage, and the serious effects of the coal strikes.



**BERNARD M. BARUCH**  
*New Adviser to Byrnes*

port as new capacity on that date, units which are expected to be in operation during the third quarter. There is no definite rule on the reporting of new capacity and much depends on the judgment of the company. During normal times it is not difficult to forecast completion dates but under present war conditions, a reasonably accurate forecast is practically out of the question.

Although the alleged blame for the lagging steel expansion program has been shifted from one group to another and back again, probably no group reasonably could be charged with the complete responsibility for this retardation. The ill-fated priority system was responsible primarily in the beginning for the lack of coordination in piecing the important parts of the steel program together. The urgent needs of the armed forces were continually upsetting manufacturers' schedules on items needed for the steel expansion projects.

A very definite factor in retarding some of the steel expansion construction program was the great number of labor troubles. Innumerable cases of jurisdictional disputes, inefficiency, and lack of semi-skilled help kept many a project in a state of confusion for some time. Added to this were the troubles encountered by contractors in going through red tape and making trips to Washington in order to expedite or obtain badly needed items.

It has been said that the steel industry never wanted the expansion

## Numerous Factors Retard Expansion

### Pittsburgh

• • • Blowers for blast furnaces, cranes for open hearths, various auxiliary equipment for electric furnaces, and delays in blooming mill shipments—these (through no fault of the equipment makers) represent bottlenecks which have made the setting of completion dates for steel expansion projects the latest national "guessing game." Topping these retarding elements is the major one of the manpower shortage, which as time goes on will become a prime factor in determining whether new blast furnaces or steel plants, once completed, will operate at capacity.

Behind these spectres which are continually harassing WPB and the steel industry remains the threat of insufficient coke to adequately utilize not only new blast furnaces to come, but existing units as well. The recent coal strikes have done much to intensify the probability of a coke shortage later in the year.

Furthermore, the advent of warm weather invariably means production losses—sometimes as much as 4 to 7 per cent in raw steel output, due to the effect of the heat upon the workers' efficiency. All of these intangible factors have combined with other known angles to make it an impossibility to determine just when incomplete steel expansion projects definitely will be in production.

Recent statistical information and charts, indicating capacity as of certain dates or months, have only been good up to the time that they were made, and in some instances they represented what was anticipated but which, in many cases, was not realized. For statistical and other purposes steel capacity which is expected to be brought in during the first quarter of any year often is included as existing capacity as of the first of January. The same principle applies for capacity figures as of July 1 in any given year, since most steel companies re-

program and some quarters have hinted that because of this the steel industry probably was responsible for some of the hold-ups. There is no evidence to support this viewpoint. It is well-known in steel circles that steel officials would rather have had the chance to exploit existing facilities to the "nth" degree instead of using time and materials from existing equipment to build new projects. However, once the issue was settled and the steel expansion program was decided upon by the government, the steel industry did and has done everything in its power to bring to completion as rapidly as possible Defense Plant Corp. jobs.

There is a big difference between completion of parts of these projects and completion of the total projects themselves. There is also a big difference between completion of the projects and full utilization of them. An analysis of new blast furnace, open hearth, and electric steel project progress shows that in practically all cases major parts of the program have been built but could not be utilized because certain small but important parts were unavailable at the time needed.

In the case of blast furnaces the major hold-up has been and still is the extended deliveries on blowing equipment. Figuring in on this factor also is the difficulty in obtaining electric motors. It was not that the blowing equipment manufacturers failed to realize the urgency of the blast furnace needs but rather it was impossible for them to make deliveries because of certain Naval programs which came and are coming first.

Typical examples of the hold-ups in blast furnace completion can be found in almost every large company today where original dates for completion were passed months ago. The Pittsburgh Steel Co. blast furnace at one time was to have been blown in on April 1 of this year, later it was changed to July 1, and a conservative guess is that it may possibly be No-

vember before production is started.

The two Carnegie-Illinois furnaces at the company's Edgar Thomson Plant which were originally scheduled for around January and February of this year and later changed to April and May, probably will not be in much before July 15 and Sept. 1. The same holds true for stacks at Inland Steel and Republic Steel Corp. where new furnaces are already far behind the first, second and third estimated completion dates.

This does not mean that stoves are not built, shells are not up, and that a great part of the physical work is not done, but it does mean that these furnaces cannot produce pig iron until blowing equipment becomes available. War conditions and military needs today make it impossible to predict actual shipping dates.

### Slowup Example

An example of the slow-up in the open hearth program can be found at the Homestead steel project in this district. This job is considerably behind the original completion date and it is doubtful if the last of the 11 contemplated open hearth furnaces will be making steel before next year.

The company was expected to be making steel this week in a few of these open hearths, but could have made this initial start some weeks ago if cranes had been available. The demand for cranes by all sources including war requirements, has been so heavy and so many of the programs are reaching completion around the same time that deliveries have become quite extended. It is believed that the bulk of the Homestead project will be in operation late this fall, but still men continue to keep their fingers crossed because some new factor is always arising over which they have no control and which further sets back actual production.

The west coast Geneva works project may be in operation this fall but in addition to facing bottlenecks in

blast furnace and blooming mill equipment it also faces the prospect of insufficient manpower. One of the three blast furnaces at Geneva may be blown in sometime in August and the remaining two at some indefinite later date. With one blast furnace unit, however, steel production could get under way providing the blooming mill is not set back further.

Republic Steel Corp. at Chicago about a month ago started to make electric steel in two furnaces with cold charges. This project, including nine electric steel furnaces, four tilting open hearths for hot metal, and a blast furnace was to have been finished last fall, according to very early estimates. It may be February, 1944, before the last open hearth is ready for production. It is expected that the first tilting furnace will be completely installed by Aug. 15 and bricked by about Oct. 1. The other three units will probably come in on a schedule of about two months apart. Since the blast furnace is somewhat behind schedule, Republic may not be able to obtain hot metal from the open hearths for several months. On the other hand, the company may soon start a few more electric furnaces on cold charges. It is understood that of the nine electric furnaces, two are operating, four are practically installed, and three are being made.

### New Projects

Within the next few weeks Carnegie-Illinois' South Chicago Works probably will begin to operate its new 70-ton electric furnaces. The Duquesne works of Carnegie-Illinois here a week or so ago tapped the first heat from the third furnace in this project—a 70-ton type Heroult furnace, thus completing this project of two 70-ton and one 35-ton furnaces.

The Andrews Steel Co. project in Kentucky is being pushed to completion and in July or August may have two 60-ton and one 25-ton electric furnaces melting. Copperweld Steel at Warren, Ohio, is expected to have its triplexing electric steel project completed by September or October of this year. This will consist of modified cupolas, bessemer converters, and two 25-ton Swindell-Dressler electric furnaces. Scrap will be melted down in the cupolas, the metal blown in the converters, and refined in the electrics. The A. M. Byers Co. here may also add a new 25-ton electric furnace. Barring unforeseen circumstances, the electric steel program may be totally completed by early next year, the bulk of it melting steel late this fall.

**AMPHIBIOUS TRUCK:** The Army's new two and a half ton amphibious truck cruises along in the ocean off Carrabelle, Fla., with a full load of fully equipped troops.





## Farm Equipment Program Given 300,000 Tons of Steel for 3rd Quarter

### Washington

• • • Constituting one part of the OWM order to step up steel output by 1,000,000 tons in the third quarter, WPB Chairman Donald M. Nelson last week announced a substantially expanded program for the production of farm machinery, to get under way July 1.

A total of 300,000 tons of carbon steel, with other materials in proportion, was allocated to the farm ma-

*See story on a new farm order on P. 158.*

chinery program for the third quarter. To assure continuous and balanced production, Mr. Nelson said, advance authorizations totalling an additional 200,000 tons of steel also have been approved for each of the three quarters from Oct. 1, 1943, to July 1, 1944. During the third quarter of the present year, special emphasis will be given to the manufacture of harvesting machinery for this year's crop.

It was stated that the total authorizations for the quarter and for the year beginning July 1 will make it possible to meet the farm machinery production program requested by the War Food Administration.

Farm equipment manufacturers were authorized by telegram to place orders for materials for the new program. The telegrams included allotment number under CMP which made it possible for the manufacturers to place authorized orders immediately.

A new farm machinery order to replace L-170, under which the industry has been operating, will provide for

the production of new machinery at approximately 80 per cent of the 1940 level, and will eliminate the concentration features of L-170 so as to assure adequate production, distribution, maintenance and repair facilities, according to WPB.

The whole farm machinery program has been stepped up by advancing the completion dates for the quotas established in L-170 for the year which began Oct. 1, 1942, and by placing the farm machinery industry on a new annual basis beginning July 1. Of

the 300,000 tons of carbon steel allotted for the third quarter of this year, 83,723 tons will be used for completion of the increased program of harvesting machinery decided upon in March and the remainder will constitute first quarter authorizations under the new order.

Under a temporary order issued some weeks back farm machinery manufacturers had been allowed to place limited orders for their third-quarter requirements, which would carry them until the final order was issued. In addition, the WPB allocated restricted quantities of vital materials to manufacturers whose equipment was a critical necessity for certain types of farm work.

## More Boats Needed for Ore Service Is Warning of Experienced Lake Operators

### Cleveland

• • • In broadening the permit system to cover virtually every commercial craft on the Great Lakes, the Office of Defense Transportation this week gave as the reason for the move that it would help water carriers meet the 1943 iron ore goal certified by WPB as 91,000,000 tons. Shippers

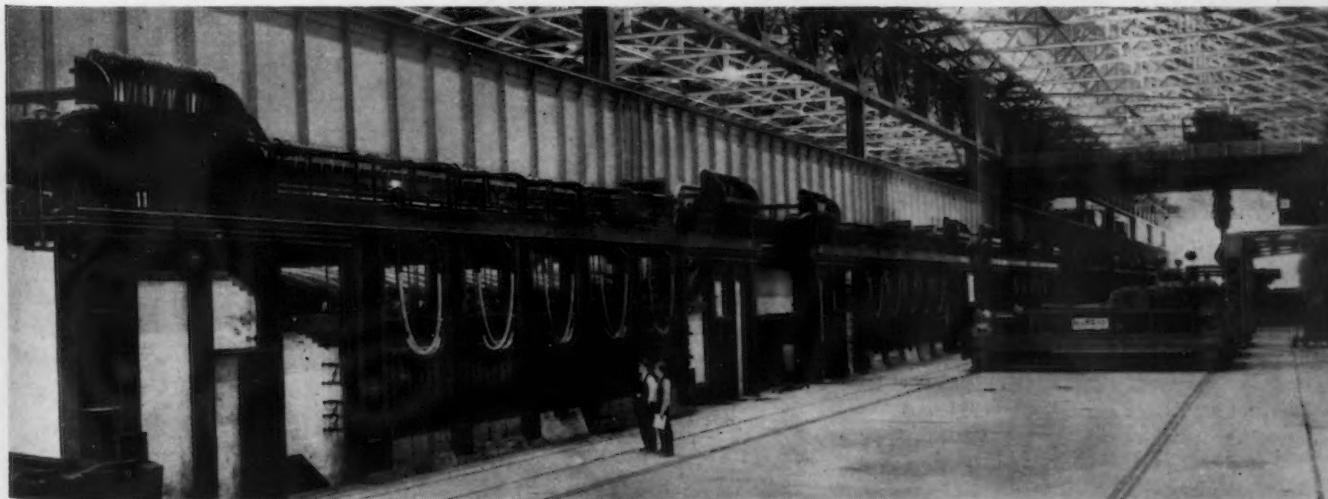
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**INSIDE NEW OPEN HEARTH SHOP:** New steel for war started flowing this week from the first two of eleven 225-ton open hearth furnaces at the Homestead works of Carnegie-Illinois Steel Corp. This is a government-financed project, which when completed will produce about 1½ million tons of ingots a year.

and carriers alike feel that this goal will not be reached this year, in spite of all such actions, unless more boats are thrown directly into the ore service.

For example, some 35 or 40 Canadian vessels, some of which are very large, were in service last year moving ore into United States ports. This year to date only one or two of these boats are in the U. S. ore trade, the balance being used in the Canadian ore trade and grain trade. Likewise, operators of class D carriers in U. S. trade find it considerably more profitable to remain in the grain trade rather than ore, and as many as possible are keeping these smaller ships busy carrying grain.

Similarly, the U. S. boats that are engaged in carrying coal from South



Chicago to Fort William, Ont., in exchange for the use of Canadian ships to haul Washington and Oregon coal to Alaska, are being slowed down so that the ore movement is not at its peak.

From the accompanying table, it can be seen that on June 1, 1943, ore shipments are 8,387,575 gross tons behind what they were on June 1, 1942. In the 69 days of shipping to June 1, 1942, the average daily downlake ore movement was 309,087 gross tons, while this year, with 42 days' shipping, the average daily shipments totaled 307,845 gross tons. From this it can be seen that in addition to the late start of the carriers, shipments still are falling farther behind daily by some 1200 tons. Instead of gaining ground on the original deficit, they are losing ground.

The new ODT order, general order ODT 25-A, requires ODT permits for the operation of all vessels except liquid bulk carriers, which are covered by another ODT order, and vessels specifically exempted as follows: (1) Vessels used in transportation of

	1942			1943		
	March	April	May	March	April	May
Ore Shipments to U. S. and Canadian Ports, Gross Tons.	792,602	7,857,106	12,327,064	1,954,817	10,974,672	
Cumulative Shipments to End of Month, Gross Tons.	792,602	8,649,708	21,327,064	1,954,817	12,929,489	
Decrease in 1943 Total Shipments from 1942, Gross Tons.				792,602	6,694,847	8,387,575
Daily Average Shipments, to June 1, Gross Tons.			309,087			307,845

property consigned by or to the government or any departments or agencies of the government. (2) Vessels having a gross registered tonnage of less than 1000 tons. (3) Vessels engaged in trailer or semi-trailer ferry service. (4) Passenger ships and railroad car ferries. (5) Vessels engaged in transportation of iron ore. (6) Vessels engaged in the transportation of coal, provided the movement is authorized by a special permit issued under general order ODT 9-A.

A corresponding order in 1942 exempted vessels carrying coke and certain ships moving iron and steel scrap, limestone for steel making and chemical manufacture, and property in packages or containers. The order ODT 25-A reasserted the authority of ODT to require any vessel to be operated in any manner, for any purpose, and between any ports as the ODT might direct, and to be chartered, leased or rented by any persons the ODT might designate.

## Plate Requirements Found to Be Dictating the Availability of Steel

### Pittsburgh

• • • War conditions have changed the complexion of steel distribution among the various flat rolled products to a far greater extent than has been the case with other steel products. The utilization of wide strip mills for urgent plate production has cut the proportion of sheet output. On the other hand, the importance of various types of bars has reflected an increased participation for this particular item.

Comparing the year 1940, which represented a pre-war era (or at least before lend-lease shipments became heavy) with the first quarter of 1943 the participation of steel plates rose from nine per cent of the total products for sale in 1940 to 21 per cent in the first quarter of 1943.

Production of sheets for sale in 1940 represented about 22.2 per cent of total finished products compared with 14.5 per cent in the first quarter of 1943. This decline of approximately 35 per cent in the relative position of sheet production was not necessarily uniform with all sheet makers. Sheet production on continuous mills which were converted

for plate output represents a far less participation in the total finished steel products than is the case with those mills, the prime production of which is in lighter flat rolled material.

In 1940 total pipe production for sale amounted to 8.6 per cent of total products but in the first quarter of 1943, pipe output was 9.3 per cent of finished steel production. This higher trend in tubular goods is probably accounted for by bomb production, a substantial increase in the output of mechanical tubing and some rather fair sized line pipe business. The increase in the first two categories has more or less made up for the fall off in oil country goods production. Also the special tubing required for shipbuilding and aircraft has accounted for the heavy demand in the total pipe picture.

There seems to be little indication that the participation figures for the various steel products for the first quarter 1943 will change very much from the full year returns. Plates are expected to be in heavy demand for the duration and if any fall off should occur in shipbuilding requirements, it will probably be made up by farm

equipment and other essential needs. The tubular outlook will be sustained by a continuation in the shipbuilding and aircraft programs and if necessary, be supported by oil country goods orders if the steel is available.

Pre-War vs. Distribution of Various Steel Products  
1940 and 1st Quarter 1943  
(Source Material—American Iron & Steel Institute)

Products	Per cent of Total Products for Sale	
	1940	1st Quar. 1943
Plates.....	9.0	21.0
Sheets.....	22.2	14.5
Strip.....	4.7	4.0
Tin Mill.....	6.4	3.7
Bars.....	16.6	18.7
Pipe.....	8.6	9.3
Wire.....	5.9	5.4
Other.....	26.6	23.4



## 243,640,000 Tons of Raw Materials Used in Steel Industry

• • • Around 243,640,000 tons of raw materials were consumed in American blast furnaces and steelmaking furnaces during 1942, exclusive of ferroalloys and alloying elements, according to the American Iron and Steel Institute.

As production of finished rolled products last year amounted to about 62,446,000 tons, the steel industry consumed nearly four tons of raw materials for each ton of finished product produced. In the case of certain products using relatively large amounts of alloying elements and where loss of metal during manufacture runs high, as much as 5½ tons of raw materials were consumed for each ton of finished product obtained.

In the production last year of 59,076,000 tons of pig iron, 188,615,000 tons of raw materials were consumed. About 50,533,000 tons, or over 85 per cent of the pig iron produced in the industry's blast furnaces last year were charged into steel furnaces.

Besides pig iron, almost 55,025,000 tons of steelmaking materials (excluding alloys) were consumed by the steel industry last year. No estimate is available of the consumption of alloying elements.

Open hearth furnaces consumed over 85,792,000 tons of metallic raw materials other than ferroalloys. Approximately 52 per cent of that total

consisted of pig iron, about 44 per cent was scrap, and the balance consisted of the metallic weight of the ore, cinder and scale consumed last year.

More than 6,440,000 tons of raw materials, of which over 95 per cent was pig iron, went into the steel in-

dustry's Bessemer converters last year. Scrap represented the balance of the materials consumed in the Bessemer steelmaking process throughout the year.

Electric furnaces consumed about 3,721,000 tons of metallic raw materials, not including what must have been a substantial tonnage of metal in the form of the ferroalloys used in the manufacture of alloy steels. Almost 97 per cent of the total electric furnace charges consisted of scrap.

## Anti-Strike Bill and Miners' Fine Cause Fears of New Production Losses

### New York

• • • All week the steel industry has hung precariously on the brink of a further drop in output due to coal shortages which threaten as another coal strike looms out of the miners' controversy with their new employer, the government. Approximately 50,000 tons of steel production was lost during the five-day strike just ended and at least 13 blast furnaces were temporarily forced to bank their fires. The loss in coal production was set at about 10,105,000 tons by the Department of the Interior.

Capping the climax this week has been the assessment of a \$1 per day fine against the miners by Harold L. Ickes, Solid Fuels Administrator and the passage by the Senate of an anti-

strike bill aimed particularly at the coal miners—both of which stirred the miners' ire and have contributed little to the jitters of the steel industry or to the negotiations of mine wages.

The \$1 per day fine levied against the miners by Ickes was considered at the time to be a compulsory action inasmuch as such terms were a part of the miners' contracts with the operators. However, since proclamation of the fine, some doubt has crept into the picture regarding the necessity as there is a question regarding the legal validity of the contracts due to their expiration and mere agreement-extension to permit operations.

If the contracts are actually still valid, a statement which no authority has stated as yet, the government as the employer was faced with the choice of inflicting the fine or paying double the amount itself. If the contracts are not now in force but only extended in the form of an agreement, as the miners contend, the fine is considered as being unwarranted and a blow directed toward penalizing the miners. In either event, the miners are objecting strenuously and have threatened to retaliate by striking again when the fine is actually deducted from their pay envelopes.

Most conciliatory factor lies in the action by Ickes which placed the responsibility for making the pay deduction in the hands of the operators who it is believed probably will not do it since they are arbitrarily relieved of the contract responsibility by the government's domination of the mines. It is the government which acts as the operator now instead of the operators themselves which seems to provide the loophole. Some groups of miners are looking favorably toward such results.

Some signs of a settlement are seen

## Raw Materials Consumption Shows Rise

Source: American Iron and Steel Institute

Approximate Figures—Net Tons

	1941		1942	
	Consumed in Blast Furnaces	Consumed in Steel Furnaces	Consumed in Blast Furnaces	Consumed in Steel Furnaces
Iron ore.....	94,600,000	5,000,000	103,640,000	5,400,000
Coke.....	48,000,000		52,822,000	
Limestone.....	19,900,000		22,857,000	
Scrap.....	2,100,000	42,000,000	1,994,000	41,819,000
Cinder and Scale.....	7,700,000	600,000	7,302,000	906,000
Fluxes.....		6,700,000		6,900,000
	Blast Furnace Production	Production of Ingots and Steel for Castings	Blast Furnace Production	Production of Ingots and Steel for Castings
	55,101,000 tons	82,873,000 tons	59,076,000 tons	86,092,209 tons

in the temporary agreement reached between the miners and the central Pennsylvania operators which grants a \$1.30 portal-to-portal payment per day based on one hour per day consumed in getting to the mine faces. This agreement follows closely the one announced last week by the Illinois miners which called for from \$1 to \$1.50 per day as portal-to-portal payment. Either of these agreements may establish the pattern on which the national agreement can be based.

Realizing that whatever settlement the miners finally accepted higher wages would result, OPA announced this week that higher maximum prices for bituminous coal would be established but not until after the coal negotiations were complete. The higher prices would not be retroactive as the wages are expected to be but will be effective over the remainder of the coal year to April 1, 1944, OPA said.

Most disrupting factor in the wage negotiations now appears to be the anti-strike bill which is seldom interpreted otherwise than as being pointed directly at the miners. Whether such legislation is necessary or desirable has been seriously questioned when less than 1 per cent of the nation's work force is involved in strikes at one time. Whatever the need or desirability, the miners have taken strong exception to the bill and it is felt to be a disrupting influence by most observers.

Appearing to be mainly retaliation tactics by Congress against John L. Lewis the bill provides for a \$5000 fine and one year in jail or both for fomenters of strikes and further gives WLB the authority to demand the appearance of witnesses. The need for this apparently was seen in Lewis's repeated refusal to appear at WLB sessions plus the need to penalize and even jail persons who defied the government in government operated facilities.

President Roosevelt's delay in either signing or vetoing the bill at this writing is interpreted as a play for time to either smash or appease John L. Lewis depending on what his actions are as the June 20 truce deadline approaches. If the truce expires and the miners again strike the bill may be signed and immediate action against Lewis instituted. Otherwise the bill, which is not thoroughly approved by many of the legislators who voted for it, may be shelved or passed without fanfare simply because it gives statutory authority to the WLB.



Press Association

**COMPROMISE:** Charles O'Neill, spokesman for the central Pennsylvania coal mine operators, as he reported to the War Labor Board that his group had agreed with the UMW on a portal-to-portal pay of \$1.30 for the miners.

## Ingot Output in May YEAR 1943

*Production of Open Hearth, Bessemer and Electric Steel Ingots, and Steel for Castings. Source: American Iron & Steel Institute*

Based on Reports by Companies which in 1942 made 98.3% of the Open Hearth, 100% of the Bessemer and 87.6% of the Electric Ingot and Steel for Castings Production

PERIOD	ESTIMATED PRODUCTION—ALL COMPANIES						Calculated* weekly production all companies (Net tons)	Number of weeks in month		
	OPEN HEARTH		BESSEMER		ELECTRIC				TOTAL	
	Net tons*	Percent of capacity	Net tons	Percent of capacity	Net tons*	Percent of capacity			Net tons*	Percent* of capacity
January.....	6,576,589	97.8	478,058	85.9	369,395	95.4	7,424,042	96.8	1,675,856	4.43
February.....	6,033,674	99.3	447,843	89.1	344,532	98.6	6,826,049	98.5	1,706,512	4.00
March.....	6,785,295	100.9	503,673	90.5	381,219	98.5	7,670,187	100.0	1,731,419	4.43
1st Quarter..	19,395,558	99.3	1,429,574	88.4	1,095,146	97.5	21,920,278	98.4	1,704,532	12.86
April.....	6,509,812	99.9	481,810	89.4	382,532	102.1	7,374,154	99.3	1,718,917	4.29
May.....	6,664,298	99.1	483,024	86.8	398,057	102.9	7,545,379	98.4	1,703,246	4.43
June.....										4.29
2nd Quarter..										13.01
1st 6 months.										25.87
July.....										4.42
August.....										4.43
September.....										4.28
3rd Quarter..										13.13
9 months....										39.00
October.....										4.43
November.....										4.29
December.....										4.42
4th Quarter..										13.14
2nd 6 months										26.27
Total.....										52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,518,621 net tons open hearth 125,681 net tons Bessemer and 87,360 net tons electric ingots and steel for castings, total 1,731,662 net tons; based on annual capacities as of January 1, 1943 as follows: Open hearth 79,180,880 net tons, Bessemer 6,553,000 net tons, electric 4,554,980 net tons.

\* Revised January through February, 1943.



## New C-I Plant Will Add 1,494,000 Ingot Tons, 413,000 Tons Plates, Forgings

### Pittsburgh

• • • An important unit in the nation's wartime steel expansion program began producing new tonnages early this week at the Homestead, Pa., Works of Carnegie-Illinois Steel Corp., where additional steelmaking and finishing facilities are being erected for the government's Defense Plant Corp. New steel flowed from the first of eleven 225-ton open hearth furnaces in the new government-financed shop at this U. S. Steel plant.

Annual capacities of the new plant, when completed will total 1,494,000 tons of ingots, 1,060,000 tons of slabs and 413,000 tons of rolled plate, machined forgings, and rough forged plates.

Major equipment when completed will include a 45 in. slabbing mill,

20 gas fired soaking pits, a 160 in. plate mill with four heating furnaces, a 7,500 ton forging press and a machine shop and heat treating shop. The mill will roll plate up to 150 in. wide, 60 ft. long, and a minimum width of 6 in.

### Ickes Order to Republic Seen As Impractical Cleveland

• • • The order of Solid Fuels Administrator for War, Harold L. Ickes, to Republic Steel Corp., to operate its Alabama mines at full capacity on a six-day week until at least 60 days supply of coal was in storage rather than qualifies Mr. Ickes for the "leather-medal-of-the-week." In his telegram to C. M. White, vice-president of Re-

public Steel Corp., Cleveland, Mr. Ickes said: "I insist that you operate your Alabama mines to fullest possible production on six-day week until your stocks are sufficient for at least 60 days consumption. If this mine production is not sufficient to do this in a reasonable time, you are to purchase coal in the open market to make up the deficiency."

There are several factors that were overlooked in this hasty demand to build up a 60-day stock pile of coal. First, such a coal inventory would be a permanent fire hazard, subject to ignition from spontaneous combustion, and requiring expensive ventilation or constant turning over. The latter would take considerable hand labor which is not available and the former some materials that would not be available. Furthermore, with the grades of metallurgical coal available in the southern area, it has been found that if weathered for the period suggested by Ickes, the coke yield from the coal would fall sharply, thus requiring greater quantities of coal for blast furnace and mill operations than are actually necessary.

It has been the practice to maintain about a 15-day supply, and with uninterrupted mine production such a supply is adequate, as has been already proved. Republic has been working on a six-day week in that area since May 15, when an agreement for the longer work-week was made with the local units of UMW.

## Near All-Time Peak

YEAR 1942

Production of Open Hearth, Bessemer and Electric Steel Ingots, and Steel for Castings. Source: American Iron & Steel Institute

Based on Reports by Companies which in 1942 made 98.3% of the Open Hearth, 100% of the Bessemer and 87.6% of the Electric Ingot and Steel for Castings Production

PERIOD	ESTIMATED PRODUCTION—ALL COMPANIES						Calculated* weekly production all companies (Net tons)	Number of weeks in month		
	OPEN HEARTH		BESSEMER		ELECTRIC				TOTAL	
	Net tons*	Percent* of capacity	Net tons*	Percent* of capacity	Net tons*	Percent* of capacity	Net tons*	Percent* of capacity		
January.....	6,322,215	95.3	490,874	86.0	299,017	94.2	7,112,106	94.5	1,605,442	4.43
February.....	5,785,918	96.6	453,549	88.0	273,068	95.2	6,512,535	95.9	1,628,134	4.00
March.....	6,572,930	99.0	493,191	86.4	325,990	102.7	7,392,111	98.2	1,668,648	4.43
1st Quarter..	18,681,063	97.0	1,437,614	86.7	898,075	97.4	21,016,752	96.2	1,634,273	12.86
April.....	6,345,133	98.7	454,834	82.2	321,324	104.5	7,121,291	97.7	1,659,975	4.29
May.....	6,595,440	99.4	453,938	79.5	333,200	104.9	7,382,578	98.1	1,666,496	4.43
June.....	6,239,674	97.1	452,528	81.8	323,100	105.1	7,015,302	96.3	1,635,269	4.29
2nd Quarter..	19,180,247	98.4	1,361,300	81.2	977,624	104.8	21,519,171	97.4	1,654,049	13.01
1st 6 months.	37,861,310	97.7	2,798,914	83.9	1,875,699	101.1	42,535,923	96.8	1,644,218	25.87
July.....	6,345,315	95.7	453,686	79.6	345,957	96.6	7,144,958	94.5	1,616,506	4.42
August.....	6,414,637	96.5	467,293	81.8	345,725	96.3	7,227,655	95.4	1,631,525	4.43
September....	6,286,855	97.9	437,961	79.4	332,703	95.9	7,057,519	96.4	1,648,953	4.28
3rd Quarter..	19,046,807	96.7	1,358,940	80.3	1,024,385	96.3	21,430,132	95.4	1,632,150	13.13
9 months....	56,908,117	97.3	4,157,854	82.7	2,900,084	99.4	63,966,055	96.3	1,640,155	39.00
October.....	6,750,829	101.5	461,897	80.9	366,788	102.2	7,579,514	100.0	1,710,951	4.43
November.....	6,371,750	99.0	458,469	82.9	349,593	100.5	7,179,812	97.8	1,673,616	4.29
December.....	6,471,261	97.6	475,204	83.4	358,075	100.0	7,304,540	96.6	1,652,611	4.42
4th Quarter..	19,593,840	99.4	1,395,570	82.4	1,074,456	100.9	22,063,866	98.2	1,679,137	13.14
2nd 6 months	38,640,647	98.0	2,754,510	81.3	2,098,841	98.6	43,493,998	96.8	1,655,653	26.27
Total.....	76,501,957	97.9	5,553,424	82.6	3,974,540	99.8	86,029,921	96.8	1,649,979	52.14

Note—The percentages of capacity operated in the first 6 months are calculated on weekly capacities of 1,498,029 net tons open hearth, 128,911 net tons Bessemer and 71,682 net tons electric ingots and steel for castings, total 1,698,622 net tons; based on annual capacities as of Jan. 1, 1942, as follows: Open hearth 78,107,260 net tons, Bessemer 6,721,400 net tons, electric 3,737,510 net tons. Beginning July 1, 1942, the percentages of capacity operated are calculated on weekly capacities of 1,500,714 net tons open hearth, 128,911 net tons Bessemer and 81,049 net tons electric ingots and steel for castings, total 1,710,674 net tons; based on annual capacities as follows: Open hearth 78,247,230 net tons, Bessemer 6,721,400 net tons, electric 4,225,890 net tons.

\* Revised January through December, 1942.

### Recent WPB Changes

#### Washington

• • • Joe Tucker, Evanston, Ill., resigned last week as director of the Canadian Division of the WPB Bureau of Distribution and after a brief vacation will return to private industry. Before coming to Washington in 1941, Mr. Tucker was vice-president and general sales manager of the Oliver Farm Equipment Co., Chicago. Hugh Porter, who has been serving as chief of the Washington Branch of the Canadian Division, has been appointed as acting director of the division.

• • • Charles E. Kohlheep has been appointed as director of the WPB Program Bureau to succeed John F. Fennelly who has resigned to become Executive Director of the Committee for Economic Development, a private organization sponsored by the Department of Commerce. Mr. Kohlheep is on leave of absence from the Wisconsin Public Service Corp., Milwaukee.

# Industry Hit by Wave of Price and CMP Changes

## New York

• • • For the past week the steel and metal working industries have been treated to a generous barrage of changes in pricing setups and controlling regulations by the WPB. Warehouses, too, have been included in the actions with a new amendment to Schedule 49 officially establishing six new price zones for heavy line steel warehouses handling prime products and another amendment to the schedule which upped the prices of rejects and secondary galvanized sheets in Mid-West warehouses.

Also on the warehouse front was the lifting of a WPB ruling which permits mills who have produced material for warehouses scheduled through the use of CMP-11 for delivery in the third quarter, to make delivery during June. Prime purpose of the change was to move steel from producers' yards.

A threatening shortage of steel castings has caused H. G. Batcheller to issue orders to foundries that requires them to reserve a percentage of their capacity for MRO orders. This will provide available capacity for emergency repair castings.

Producers of steel rails and track accessories were notified that WPB would issue Steel Designated Allotment orders requiring that they reserve a certain portion of their schedules to provide rails ordered by railroads. Track accessories will not be covered by the Steel Designated Allotment Order but orders must bear the certification provided in order P-142 and shall be handled by producers in accordance with provisions of CMP.

Steel users and the SRC were aided this week by an order which permits the purchase of steel from SRC without affecting third quarter allotments. An interpretation included in an amendment to M-21 made clear that second hand or reusable steel is not to be included within the definition of idle or excess steel stocks. Priority Reg. 13 also prohibits the sale of steel listed with SRC except by WPB permission so that complete and accurate records of steel remaining available can be kept by SRC.

WPB avoided the creation of another chain of super-ratings by setting aside AA-1 for items of extreme urgency and immediate overseas shipment and establishing AA-2 as the top rating for next-in-importance items. It was made clear that the new AA-2 was in most respects the

equivalent of the former AA-1 and that orders downrated from AA-1 were in effect not actually pushed back.

Substantiating a warning printed in THE IRON AGE a few weeks ago that MRO orders must not be the subject of abuse by industry, WPB warned this week that all MRO applications for controlled materials would be screened carefully by WPB industry divisions in an effort to sidestep any over stocking for this purpose.

Several types of machinery including food processing, construction machinery, tracklaying tractors and others are due for slightly increased production schedules. Irrigation equipment for farms has been released from reservation and production quotas for farm machinery have been granted up to about 80 per cent of the 1941 total.

Several warehouses were named this week to be permitted to stock a supply of aluminum aviation rivets. This action was aimed particularly at supplying consumers whose orders constituted less than a mill run or for emergency supplies.

WPB is assigning authorized ammunition production schedules to the brass mills. . . . OPA is establishing industry advisory committees from all industries affected by price regulations. . . . Stainless steel producers are going to be allowed to reserve a portion of their capacity for inventory to facilitate the handling of small orders. . . . A new set of instructions for filling out Bills of Material was issued last week simplifying the instructions and enlarging the requirements on detailed bills. . . . Manufacturers buying parts to round out their lines were instructed not to use their ratings indiscriminately for parts they could make themselves. . . . Sheets from idle or excess inventory are now permitted to be used in truck and trailer bodies with certain limitations. . . . revised freight rates effective May 15 have altered the ceiling prices and their computation for certain classes of machinery, farm equipment and ferrous forgings. . . . new producers of valves for the Navy are exempt from the price ceilings observed by other producers prior to June 9.

## Steel Purchased from SRC Will Not Affect 3rd Quarter Allotments

### Washington

• • • WPB announced last Thursday that Steel Recovery Corp., Pittsburgh, will be able to keep its records of frozen and excess steel "up-to-the minute" as the result of an amendment to Priorities Regulation 13. Under the revised regulation, sales of steel listed with SRC are prohibited except on WPB authorizations, which may be obtained either from WPB regional offices or from WPB representatives at SRC.

The announcement said that a substantial listing of idle and excess steel for redistribution has already been accumulated in Pittsburgh, but that "failure to obtain notification of movement of listed steel has made the existing inventory records so inaccurate as to reduce seriously the effectiveness of the operation." It was because of this situation, WPB said, that the new method of handling special sales of idle and excess steel was adopted.

Because of the nature of the stocks

of steel listed by SRC, and because of the need to supplement third-quarter allotments of steel, WPB said that it is prepared to issue authorizations for the sale of SRC's listed steel without requiring the purchaser to count the steel bought against the CMP allotment. This ruling, it was pointed out, applies only to idle and excess steel with SRC.

Under the amendment, sales of idle and excessive steel will be authorized to consumers—that is, persons who substantially alter the form of the steel or iron which they purchase—but in making such purchases, consumers may not exceed authorized production schedules in violation of CMP Regulation 1, nor may they exceed authorized receipts in violation of CMP Regulation 2.

Applications to transfer idle and excess steel listed at SRC may be made either by the seller or by the prospective buyer to the WPB regional director or to SRC.

(Price & Priorities News Continued on Page 144)



# The Iron Age Record of CMP Regulations

*... A chronological index to the regulations, amendments, directives and interpretations issued to the Controlled Materials Plan*

## Regulation No. 1 Rights and Obligations

**CMP Regulation No. 1**—A general regulation defining the rights and obligations of those operating under CMP.

**Amendment 1, Regulation No. 1**—Added the OWU as the fourteenth Claimant Agency; set a symbol for Canadian programs; clarified allotment numbers; required monthly figures on allotment applications; clarified use of allotment numbers and reallocation of materials; made special provisions for Class A products sold for MRO; provided for small orders not covered by allotments and made other functional changes.

**Amendment 2, Regulation No. 1**—Outlined a method for protecting production schedules of Class A products and defined the endorsement needed on orders including the hand endorsement authorized in CMP Regulation No. 7.

**Regulation No. 1, amended**—Establishes further symbols for use by Claimant Agencies, abolishes numerical identification of months and quarters, establishes use of quarterly validity for allotments, made certain changes in allotment extension, etc.

**Regulation No. 1, Revised**—Monthly percentage restrictions, heretofore imposed on placement of controlled material orders, have been eliminated from the terms of the regulation.

**Direction 1, Regulation No. 1**—Stopped displacement of priority rated orders on mill schedules by CMP orders providing the rated orders were placed on or before March 22 for delivery in the second quarter. After April 15, rated orders which had not been converted to allotment number orders were to be superseded by allotment number orders as required by Regulation No. 1.

**Direction 1, Amendment 1, Regulation No. 1**—Made the time limit quoted in Direction 1 read "as of March 22" instead of "on or before March 22."

**Direction 2, Regulation No. 1**—Users of aluminum rod and bar protected against displacement of their orders on mill schedules until May 1 instead of April 15.

**Direction 3, Regulation No. 1**—Copper Wire mills protected against displacement of their orders on mill schedules until May 1.

**Direction 4, Regulation No. 1**—Brass mills are protected against displacement of their orders on mill schedules until May 1.

**Direction 5, Regulation No. 1**—Requires that commercial warehouse orders for heat treated steel be cancelled or renegotiated.

**Direction 5, Amendment 1, Regulation No. 1**—Direction refers only to carbon or alloy steel bars instead of all carbon or alloy steels as previously stated.

**Direction 6, Regulation No. 1**—Steel producers who may lack some few types to fill an order for an allotment of controlled material will be permitted to obtain the material to fill the order from another producer.

**Direction 7, Regulation No. 1**—Orders for aluminum castings approved for April delivery on Form PD-26A have been given the status of authorized controlled material orders which must be accepted and filled by aluminum producers in the manner prescribed by CMP Reg. 1.

**Direction 8, Regulation No. 1**—A producer of aluminum may not convert it for his own use beyond the specified forms or shapes except on an authorized controlled materials order or by specific direction.

**Direction 9, Regulation No. 1**—A brass mill or wire mill may accept an authorized controlled material order for a brass mill product which it does not produce, provided that before accepting the order the mill has made arrangements to have the material called for by the order produced by another controlled materials producer.

**Direction 10, Regulation No. 1**—Rolled and forged armor plate are defined as Class A products except as delivered from the steel rolling mill as a controlled material.

**Direction 11, Regulation No. 1**—Steel deliveries on controlled material orders which cannot be filled in April or May must be carried over into the third quarter and delivery made after June 1.

**Direction 12, Regulation No. 1**—Water well drillers may now obtain materials necessary for conduct of their business by filing a CMP-4B application.

**Interpretation 1, Regulation No. 1**—Clarified what constitutes discrimination in the acceptance of orders under CMP.

**Interpretation 2, Regulation No. 1**—Made clear that duplication of CMP orders, even though with intentions to cancel later, was prohibited by the regulation.

**Interpretation 3, Regulation No. 1**—Manufacturers of equipment selling controlled materials for use with the equipment may include these requirements with applications for allotments.

**Interpretation 4, Regulation No. 1**—A Class A product need not be classed as the same Class A product if it differs by one or more specifications.

**Interpretation 5, Regulation No. 1**—Orders for controlled materials placed before the purchaser has received his allotments may be converted into controlled materials orders when allotments are received by furnishing the supplier with duplicate copies of the purchase orders.

**Interpretation 6, Regulation No. 1**—Clarifies what constitutes acceptable orders for controlled materials. Restricts acceptance to materials that can be produced within the scheduled delivery limits.

**Interpretation 7, Regulation No. 1**—Manufacturer should segregate material for his own use and material sold to others if held to be repairs or operating supplies.

**Interpretation 8, Regulation No. 1**—Clarifies the length of validity of an allotment, specification of delivery dates, rejections of orders and related permissible actions.

## Regulation No. 2 Inventory Controls

**CMP Regulation No. 2**—Established the quantities of controlled materials permitted on purchase schedules and controlled inventories.

**Regulation No. 2, amended**—Permits acceptance of orders for controlled materials which are to be reconverted into another form of controlled material.

**Direction 1, Regulation No. 2**—Partially removes from controls of Regulation No. 2 those

**EXECUTIVE COMMITTEE OF THE NATIONAL ASSOCIATION OF PURCHASING AGENTS:** Standing, left to right, are: George L. McCaffrey, Owen-Dyneto Division, Auto-Lite Battery Corp., Syracuse, N. Y.; O. E. McClatchey, Barnsdall Oil Co., Tulsa, Okla.; Lee A. Baumhover, Portland, Ore.; Emil H. Jones, E. R. Wagner Mfg. Co., Louisville. Seated, left to right, are: Leonard Tolson, MacLean Publishing Co., Ltd., Toronto; Gerald R. Smith, Indiana Service Corp., Fort Wayne, Ind.; R. C. Haberkern, R. J. Reynolds Tobacco Co., Winston-Salem, N. C.; Ben R. Newbery, Lone Star Gas Co., Dallas, Tex.; R. C. Swanton, Winchester Repeating Arms Co., New Haven, Conn.; Gordon S. Yost, Toledo Scale Co., Toledo.



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## FOR PROBLEMS LIKE THESE

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**PROBLEM:** To increase productive capacity without enlarging plant.

**SOLUTION:** Addition of mezzanine floor and substituting Baker Crane Truck for overhead crane removed.

**B**

**PROBLEM:** To increase the efficiency of handling operations in a large chemical plant.

**SOLUTION:** A fleet of Baker Fork Trucks contributes materially to net profits by saving time and money in general handling, truck and car loading, and multiplying the value of storage space by high tiering.

**C**

**PROBLEM:** To speed aircraft production.

**SOLUTION:** Several large aircraft manufacturers use Baker Trucks for spotting fuselages, engines and propellers in position for assembly, for die handling and for many other vital operations.



**PROBLEM:** To cut handling costs for the world's largest domestic range manufacturer.

**SOLUTION:** A fleet of 8 Baker Trucks has cut handling costs upwards of 75%, besides speeding production and increasing plant capacity without adding to overhead.

**D**

**PROBLEM:** To speed changing of heavy dies and to provide more efficient die-handling generally.

**SOLUTION:** Baker Hy-Lift Truck with die-handling winch makes quick work of removing or placing dies in position, and simplifies storage of dies. Baker Crane Trucks store heavy dies in yards, releasing inside space.



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In Canada: Railway and Power Engineering Corp., Ltd.

# Baker INDUSTRIAL TRUCKS

operators coming under Utilities Order U-3.

**Direction 2, Regulation No. 2**—Removed those producers included under Utilities Order U-1 from the provisions of CMP Regulation No. 2.

**Direction 3, Regulation No. 2**—Removed those operators included under P-98-c from the provisions of CMP Regulation No. 2.

**Direction 4, Regulation No. 2**—Removed operators included under P-56 from the provisions of CMP Regulation No. 2.

**Direction 5, Regulation No. 2**—Banned acceptance of tinplate shipments for the making of cans by controlled material users in four western states between April 15 and Sept. 30, 1943.

**Direction 6, Regulation No. 2**—Prohibited acceptance of delivery of structural steel for construction more than 60 days before it is scheduled to be fabricated or, if it is not to be further fabricated, before it is scheduled to be assembled.

**Direction 7, Regulation No. 2**—An operator may maintain materials for emergency repairs on transportation systems to the extent authorized by WPB Transportation Equipment Div. under Order P-142.

**Direction 8, Regulation No. 2**—Exempts deliveries of steel pit castings from the restrictions of Paragraph (b) (1) of the Regulation.

**Direction 9, Regulation No. 2**—Abolishes the 60-day limitation on inventories of steel pit castings.

### Regulation No. 3 Preference Ratings

**CMP Regulation No. 3**—Defined the operation of preference ratings under CMP.

**Regulation No. 3 Amended**—Placed rating extensions under the limits provided in Priority Regulation No. 3, clarified certification of orders and permitted extension of priority ratings with allotment numbers to secondary producers for second quarter delivery.

**Regulation No. 3, Amended**—Permits dealers, distributors, and jobbers or other persons who receive rated orders bearing allotment numbers or symbols for materials other than controlled materials, which are not manufactured by them or for which they have received no authorized production schedule, to extend the rating with the same allotment number or symbol, certifying they are permitted to do so.

**Regulation No. 3, Amended**—An allotment number or symbol applied to a rating after June 30, 1943, shall not have any effect on the rating.

**Direction 1, Regulation No. 3**—Warehouse orders for controlled materials placed prior to April 7 protected from displacements on mill schedules if scheduled for delivery by June 30.

**Direction 1, Amended, Regulation No. 3**—Revised to indicate that its intention is to place rated orders of dealers, distributors, and jobbers on a par with orders in the same rating band bearing allotment numbers or symbols.

**Direction 2, Regulation No. 3**—Requires manufacturers of combat measuring instruments to schedule production of such items on the basis of preference ratings alone, without reference to allotment numbers.

**Interpretation 1, Regulation No. 3**—Subjects the precedence of priority ratings with allotments to the regulations of Priorities Regulation No. 12.

**Interpretation 2, Regulation No. 3**—Clarifies how and when a producer of a controlled material may purchase a controlled material from another producer to fill out a line.

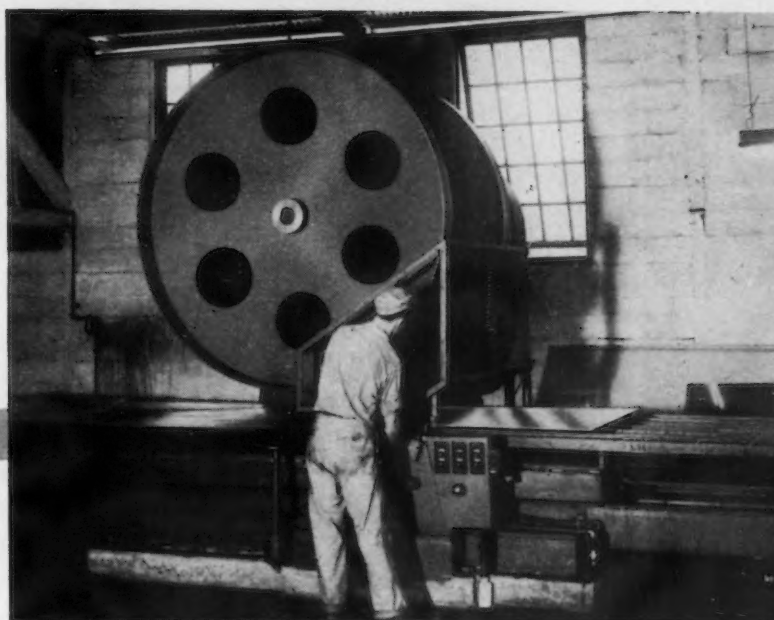
### Regulation No. 4 Warehouse Marketing

**CMP Regulation No. 4**—Specified the procedure to be followed by warehouses and distributors in marketing controlled materials after March 31. This regulation did not im-



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STAINLESS STEEL  
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Jessop makes corrosion-resisting, heat resisting, and high strength stainless steels in standard analyses for all applications.

In addition to the most popular stainless steels falling into these classifications, there are other types which combine all three characteristics in varying balances. All are produced in electric furnaces under careful regulation of the Jessop Controlled Quality Plan.

Special analyses will be furnished on specific request. Our representatives will be glad to advise you on particular applications. Write for complete information.

TRADE NAME	TYPE	ANALYSIS			
AUSTENITIC STAINLESS STEELS (Cr-Ni)					
Hi-Gloss	302	C-.08/.20%	Cr.-17.50/20.00%	Ni-8.00/10.00%	
Hi-Gloss	304	C-.08 max.	Cr.-18.00/20.00%	Ni-8.00/10.00%	
Hi-Gloss*	303	C-.20 max.	Cr.-17.50/20.00%	Ni-8.00/10.00	
Hi-Gloss-MO	316	C-.10 max.	Cr.-16.00/18.00%	SE-.15/.35%	
Hi-Gloss-Ca	347	C-.10 max.	Cr.-17.00/20.00%	Ni 10.00/14.00	
CHROMIUM STAINLESS IRONS AND STEELS					
Duro-Gloss C-1	410	C .15% max.	Cr. 10.00/14.00%	Mo 2.00/3.00	
Sta-Gloss-A	420	C .35%	Cr. 12.00/14.00%	Ni 8.00/12.00	
Sta-Gloss-B	440	C .60%	Cr. 14.00/18.00%	Co-10xC	
Duro-Gloss*	416	C .15% max.	Cr. 12.00/14.00%	S-.15/.35%	
Duro-Gloss	430	C .12 max.	Cr. 14.00/18.00%		

\*Free Machining Grade.

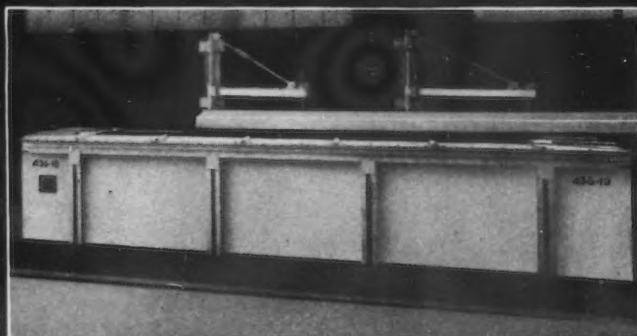
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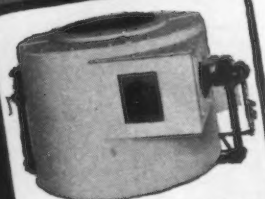


R-S pioneered in the development of Salt Bath Furnaces for the heat treatment of aluminum alloy parts. Some of these installations have been in continuous operation for fifteen years or more.

The exceptional results obtained in temperature uniformity with the consequential uniform physical properties, have convinced such customers that these furnaces have no equal for heat treating aluminum.

High capacity with minimum floor space is also an important consideration.

If you need additional facilities for heat treating aluminum aircraft parts or stampings, we shall be glad to submit detailed information on the equipment required.



Small R-S Salt Pot Furnaces are used for tempering, the solution heat treatment of aluminum parts, and for hardening steel.

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## NEWS OF INDUSTRY

plement the purchase of controlled materials by warehouses.

**Amendment 1, Regulation No. 4**—Subjected orders rated AA-5 or higher for delivery before July 1 to certain quantity restrictions and required order endorsement with the appropriate allotment number.

**Wire Mill Direction 1, Regulation No. 4**—Issued to all warehouses distributing wire mill products, removed certain sizes of wire and cable from the 500-lb. delivery restriction.

**Brass Mill Direction 1, Regulation No. 4**—Issued to all warehouses distributing brass mill products, named products not held within the 500-lb. delivery restrictions.

**Brass Mill Direction 1-A, Regulation No. 4**—Lifts weight limitations placed on deliveries of copper in the case of condenser tubes.

**Direction 1, Regulation No. 4**—Resellers of controlled materials for export other than to Canada permitted to accept allotments from their foreign customers.

**Interpretation 1, Regulation No. 4**—Defines "distributors" and "warehouses" and outlines sales that can be made by them under L-158.

### Regulation No. 5

#### Obtaining MRO Supplies

**CMP Regulation No. 5**—Establishes the methods for obtaining maintenance, repairs and operating supplies.

**Regulation No. 5, Amended**—Adds three items to List A of the regulation.

**Regulation No. 5, Amended**—MRO orders have been given a rating immediately under direct military, except, for example, such materials as are under allocation controls. The up-grading of MRO orders is also available for persons not operating under Schedules I and II.

**Direction 1, Regulation No. 5**—Sets up procedure for purchase of aluminum patterns under CMP.

**Direction 2, Regulation No. 5**—Wire used in making footwear will be treated as an operating supply under CMP regardless of whether such wire is charged to operating expenses.

**Direction 3, Regulation No. 5**—There will be no downrating of orders for controlled materials placed prior to May 16, 1943, which are required for maintenance, repairs and operating supplies.

**Direction 4, Regulation No. 5**—Steel stitching wire used by printers and publishers for purposes defined in order L-291 is an operating supply which comes under the provisions of the regulation.

**Interpretation 1, Regulation No. 5**—Permits obtainance of office supplies under terms of the regulation providing they do not fall within the categories shown in List A.

**Interpretation 2, Regulation No. 5**—Persons operating under this regulation are not permitted to use the MRO symbol for the purpose of making allotments of controlled materials to others.

**Interpretation 3, Regulation No. 5**—Reels required for shipment or delivery of products are not included within the term "fabricated containers."

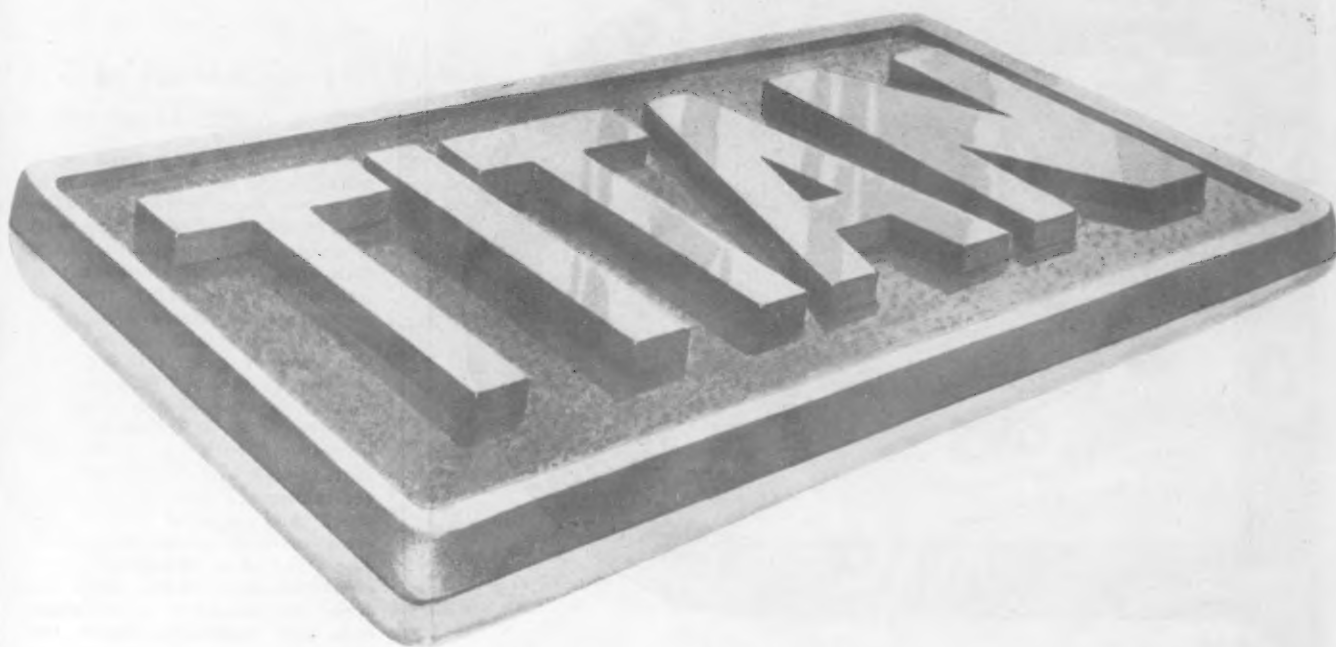
**Interpretation 4, Regulation No. 5**—Materials required for the manufacture of containers are production materials and cannot be obtained under the procedures established by Regulation 5.

**Interpretation 5, Regulation No. 5**—Preference ratings assigned to a particular business may be used to obtain MRO items for general offices, branch offices, salesrooms, and other facilities essential to the conduct of the business.

**Interpretation 6, Regulation No. 5**—The term "public transportation" appearing in Schedule I includes any person who operates a vehicle for transporting the general public.

**Interpretation 7, Regulation No. 5**—Food processors have been added to the list of manufacturers who will be permitted to obtain





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Again today, as in World War I, the exacting requirements of war are proving the mettle of men as well as the metal they produce.

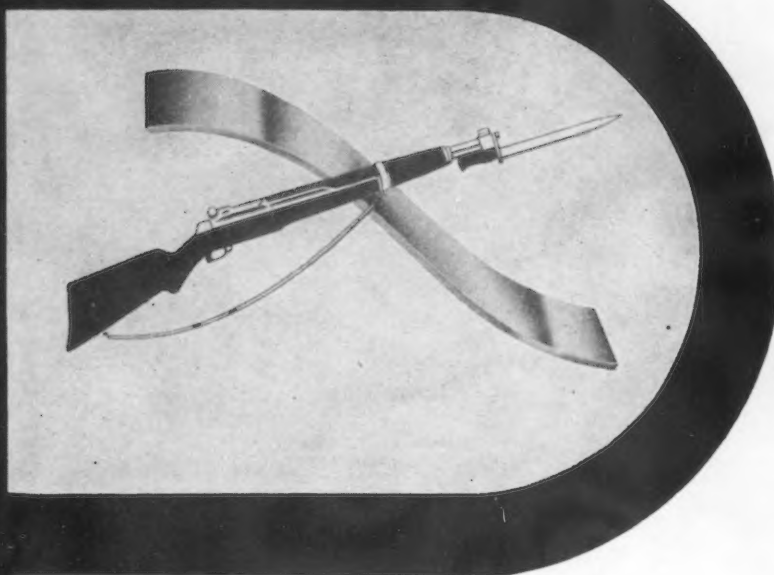
Qualitatively and quantitatively, the Men of Titan are multiplying their metallurgical skill by expanded production facilities. They are contributing to the striking power of the fighting equipment which depends on the rare properties of brass and bronze alloys for many vital parts.

In looking ahead to Victory, the Men of Titan now offer post-war planners the experience and personal attention that helped build a Great Name in Bronze.

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**METAL MANUFACTURING CO.  
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In spite of the fact that Stainless Steel is strategically important—and on the critical list—PAGE is producing great quantities of Stainless Steel Wire.

Corrosion-resisting wire for airplane controls, rifle springs, Lock wire, Safety wire, cotter pins—and binding wire for armatures because of its non-magnetic qualities.

Much as we knew about the working qualities of Stainless Steel, we have learned a great deal more because of this stream of production—acquired intimate knowledge that will be of great value to American industry after the war.

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## New Sub-Machine Gun In Mass Production

• • • A new sub-machine, so small it can be carried in a brief case, yet so effective that after 49,600 rounds of test firing with a single weapon its accuracy improved, now is in mass production for the Army, the War Department announced recently.

Known officially as the M-3 sub-machine gun, it is 0.45 cal., weighs less than 9 lb. complete, and is capable of 450 rounds a minute. It is of all-metal construction, with a collapsible metal stock and cylindrical barrel taking the place of the wood stock and tapered barrel formerly used in sub-machine guns. The weapon is fabricated principally from stamped parts for speed and economy in manufacture and assembly. When the gun is in a closed position, its length is 22 in.

maintenance, repair and operating supplies under Regulation 5.

### Regulation No. 5A

#### MRO for Government Agencies

CMP Regulation No. 5A—Provided government agencies and institutions with a means of obtaining MRO supplies under CMP.

Regulation No. 5A, Amended—Adds three items to List A.

Regulation No. 5A, Amended—Extends provisions to governmental agencies and institutions in the Dominion of Canada.

Regulation No. 5A, Revision—Defines the limitations that are to be placed on the allocation of controlled materials to governmental agencies and institutions for maintenance, repair and operating supplies.

Interpretation 1, Regulation No. 5A—Interpretations of the provisions of CMP Regulation 5 are applicable to corresponding provisions of Regulation No. 5A.

Interpretation 2, Regulation No. 5A—Non-profit corporations engaged in fighting forest fires may obtain repair parts under CMP as provided in Regulation 5A.

### Regulation No. 6

#### Construction and Facilities

CMP Regulation No. 6—Not issued to date.

### Regulation No. 7

#### General Order Certification

CMP Regulation No. 7—Provided a simplified certification form for use in endorsing delivery orders.

### Regulation No. 8

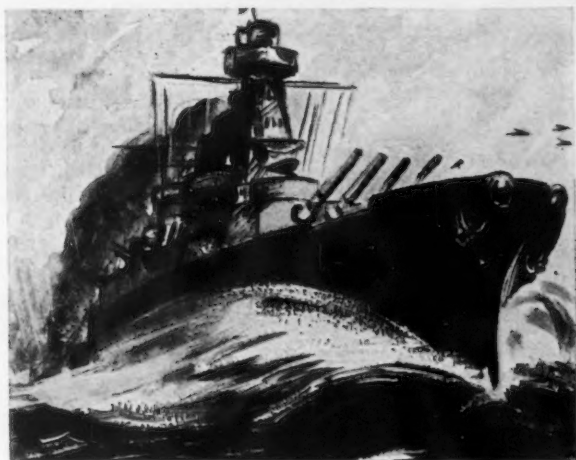
#### Production Needs of CMP Producers

CMP Regulation No. 8—Provided procedures under which CMP producers could obtain controlled materials, Class A or B products of other materials required for the production of controlled materials.

Regulation No. 8, Amended—In some instances where a controlled material producer requires the same basic material as that which he produces to fabricate another form of controlled material, such material may be made available through the allotment procedure rather than by directive.



**S**oup Kettles...



...or **B**attleships

For every stainless and alloy welding job there is an Arcos electrode of the proper analysis. Ordnance, marine, aircraft, oil, rubber and other critical equipment is being welded with one or another of the thirty-six different analyses which Arcos is in a position to supply. Take advantage of over twelve years of specialized production and research — specify Arcos Electrodes.



**Distributors Warehouse Stocks in the Following Cities:**

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Boston, Mass. (Belmont), H. Boker & Co., Inc.,	Los Angeles, Calif.....Victor Equipment Co.
W. E. Fluke	Milwaukee, Wis.....Machinery & Welder Corp.
Buffalo, N.Y.....Root, Neal & Co.	Moline, Ill.....Machinery & Welder Corp.
Chicago, Ill.....Machinery & Welder Corp.	New Orleans, La.....Wm. D. Seymour Co.
Cincinnati, Ohio.....Williams & Co., Inc.	New York, N. Y.....H. Boker & Co., Inc.
Cleveland, Ohio.....Williams & Co., Inc.	Oklahoma City, Okla.....Hart Industrial Supply Co.
Columbus, Ohio.....Williams & Co., Inc.	Pampa, Texas.....Hart Industrial Supply Co.
Detroit, Michigan.....C. E. Phillips & Co., Inc.	Pittsburgh, Pa.....Williams & Co., Inc.
Erie, Penna.....Boyd Welding Co.	Rochester, N. Y.....Welding Supply Co.
Fresno, Calif.....Victor Equipment Co.	San Diego, Calif.....Victor Equipment Co.
Ft. Wayne, Ind.....Wayne Welding Sup. Co., Inc.	San Francisco, Calif.....Victor Equipment Co.
Honolulu, Hawaii.....Hawaiian Gas Products, Ltd.	Seattle, Wash.....Victor Equipment Co.
Houston, Texas.....Champion Rivet Co. of Texas	St. Louis, Mo.....Machinery & Welder Corp.
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## NEWS OF INDUSTRY

### Questions and Answers Relating to Brass Mill Operations Under CMP

#### I—General

• How will replacement of distributor's stocks be handled under CMP?

ANSWER—Replacement of distributors' stocks is handled by WPB directives as heretofore.

• Under full CMP operation will the method for securing copper for the mill's production requirements be changed?

ANSWER—No. Same procedure will be followed as heretofore, that is, the use of Form PD-59 Revised, and in the case of re-draw and re-roll mills, Form PD-59-A.

• What new forms are planned to cover orders booked and actual shipments? (It is presumed that Form PD-123 will be discontinued and that some other form will take its place.)

ANSWER—Form PD-59E for Authorized Controlled Material Orders booked and Form PD-123D for Authorized Controlled Material Orders shipped.

• Has a definite procedure been outlined for obtaining authority to increase production schedules requiring revisions because unusual or unexpected orders are received after the CMP-4B application has been filed by a producer of Class B, Group 2 products made from controlled materials?

ANSWER—At the present time this authority is obtained by the filing of a completely revised CMP-4B application.

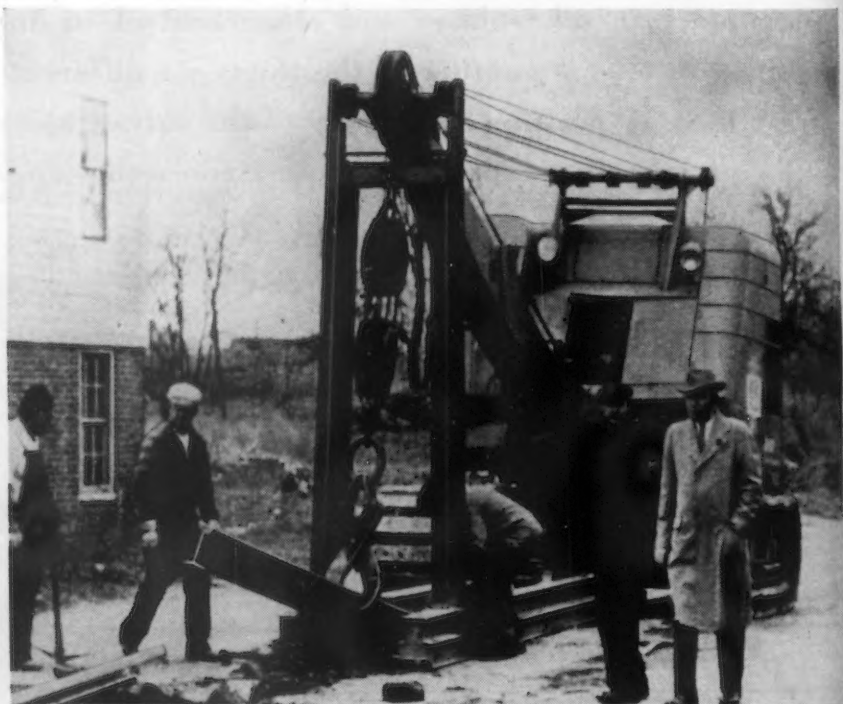
• What action is to be taken where customers have extended one set of CMP numbers and have later revised them, or in some cases have given us outright cancellations? Are we to notify WPB of these changes and cancellations, and if so, how?

ANSWER—There is in preparation a form which will be issued for the reporting of such changes or cancellations.

• When an order is presented to a mill for acceptance, how soon must a mill notify a customer whether or not it can accept an order; for instance, an order placed 46 days in advance of the first day of the month in which delivery is required, if held for 2 days or more and then rejected would be too late to be placed with another mill.

ANSWER—At the present time there is no time limit within which the mill must notify the customer as to acceptance or rejection of an order, however, this ob-

**SCRAP EXCAVATOR:** This special excavator rig removed as much as 1700 ft. of street car track in four hours during recent salvage operations in Rhode Island. Hydraulically controlled, it pulls up the track without removing the spikes, and leaves the ties in place in the road bed.





# 1250-TON

## HOT METAL MIXER

### EQUIPPED FOR SAFETY WITH

- 1 Dual electric motor drive for normal operation — either motor capable of operating mixer should one motor fail.
- 2 Air-motor for emergency, automatic return of mixer to safe position if power fails while pouring.

*but only* **TOTALLY SAFE** *when* **PROTECTED**  
*by the* **EC&M System of MIXER CONTROL**



**H**OT METAL MIXERS require the utmost protection against spillage. They are normally operated by two motors, connected through the gearing to tilt the mixer for pouring and to return it to the safe position. Motors are usually of a size sufficient to permit operation by one motor should the other motor fail. In addition, an air-motor is provided for automatically returning the mixer to the upright position should power fail while pouring.

For complete safety with this arrangement, EC&M recommends and supplies 2 controllers, 2 brakes (both air and magnetically-released), 2 master switches with quickly detachable coupling and air-interlock panel. There is nothing safer than this EC&M method of control for the tilt motion of Hot Metal Mixers.

*For complete details, see other side  
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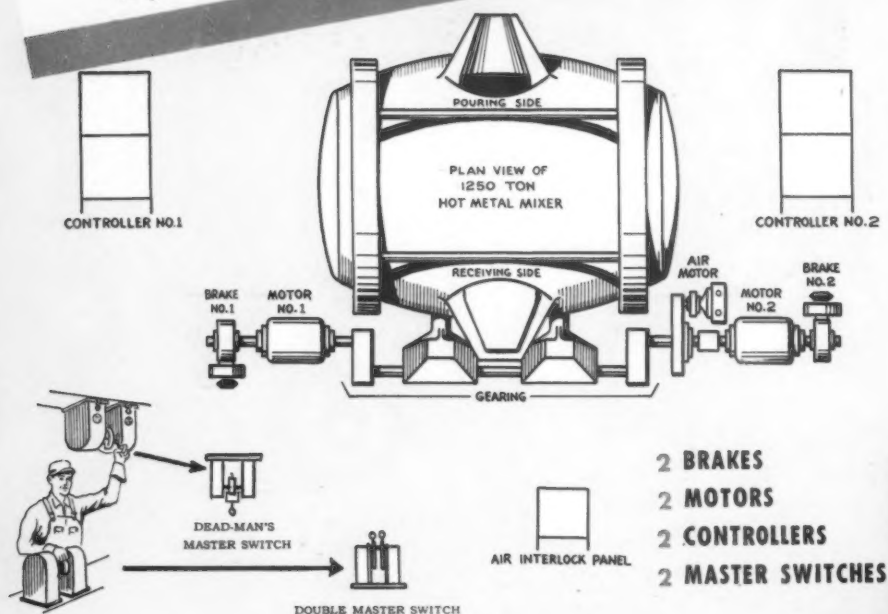


**THE ELECTRIC CONTROLLER & MFG. CO.,** Cleveland, Ohio

# This DUAL Electric DRIVE

made 100% SAFE

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THIS 2-motor drive with series-wound brakes is completely protected by the EC&M Method of Control. Each Brake is equipped with 2 separate windings for positive release of both brakes in an emergency should one motor or any part of one motor circuit become disabled.

No matter where the fault may occur—in the brake, the motor, the controller, or the wiring of either circuit—the other circuit maintains operation until the safe position of the mixer is reached and this is accomplished without any delay—no attention required by the operator—no time lost to operate knife, disconnect or transfer switches.

To insure that the mixer can be automatically returned by the air-motor if power fails, an EC&M Air-interlock panel is provided. This prevents tilting of the mixer by electric-motor drive unless sufficient air pressure is available to insure return by air, if necessary.

Besides eliminating the hazard of metal spillage, this EC&M Motor Control System for Hot Metal Mixer and Bessemer Converter Tilt Motions simplifies the controllers, the wiring between the motors and the control, and makes the installation not only lower in cost but easier to maintain. We invite you to discuss your requirements for these applications with us.

THE ELECTRIC CONTROLLER & MFG. CO.  
2700 E. 79th Street Cleveland, Ohio



EC&M Type WB Brake with 2 separate windings, one for each motor. Also arranged for air release.



EC&M Type NT Double Master Switch, mechanically connected by quickly-detachable coupling.



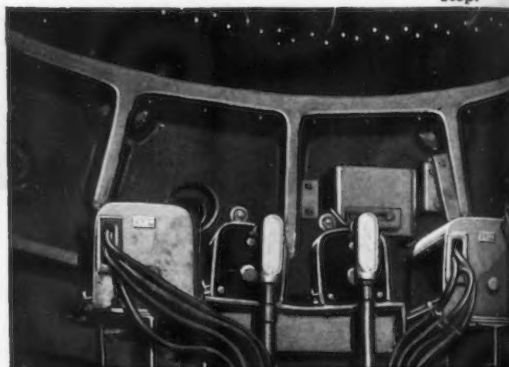
EC&M Gravity-return Dead-man's Master Switch.



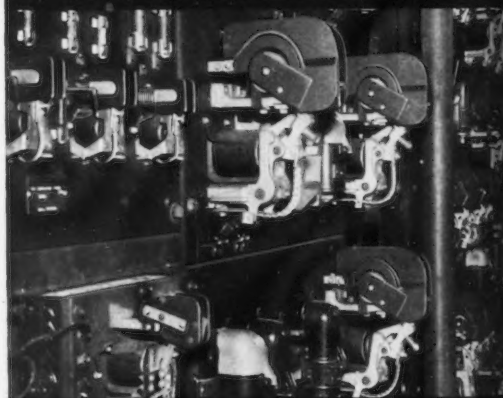
Typical EC&M Type CURRENT Control for Hot Metal Mixer Of the Reversing-P Type, with Armature Slow-down on first stop.



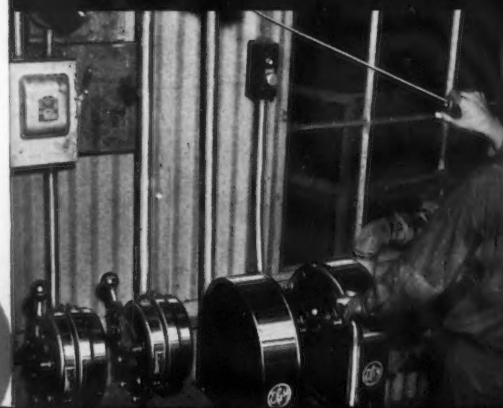
EC&M Power Circuit Limit Stop for final stop.



VIEW OF CONTROL CIRCUIT AND POWER CIRCUIT LIMIT SWITCHES ON UNDER SIDE OF MIXER



VIEW OF LINE-ARC CONTACTOR CONTROLLER



OPERATOR'S L.H. ON NORMAL MASTER AND R.H. SLIDING HANDGRIP ROPE ON DEAD-MAN'S MASTER SWITCH

# EC&M CONTROL





# DISH IT OUT *Faster!*



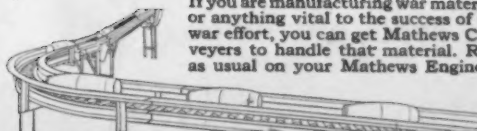
THAT'S THE WAY TO WIN this war . . . and that's the way to speed the production of vital war material.

Keeping materials, parts and supplies moving to waiting machines and eager hands with a Mathews Time-Controlled Conveyor System is a sure-fire means of making production schedules "click."

Mathews Engineers are helping American War Industries dish it out faster; perhaps they can also help you.



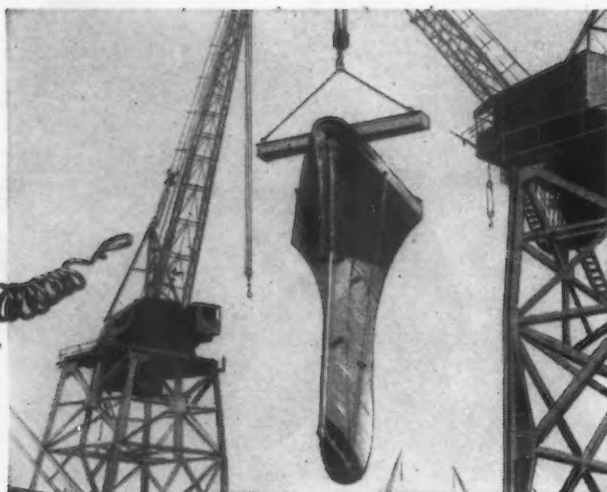
MATHEWS CONVEYERS FOR MECHANIZED PRODUCTION



If you are manufacturing war material, or anything vital to the success of the war effort, you can get Mathews Conveyers to handle that material. Rely as usual on your Mathews Engineer.

## MATHEWS CONVEYER COMPANY

ELLWOOD CITY  
PENNSYLVANIA



## Helping Speed VICTORY SHIPS "down the Ways"

# KEYSTONE *Wire*

Husky wire cables slung from giant cranes lay the first keel plates of the Victory ships. Other heavy duty cables "snub" the momentum of the rapidly completed ships as they slide down the ways. And between these stages literally miles of wire cable carry plates, fittings and sub-assemblies to the right spots, in a hurry.

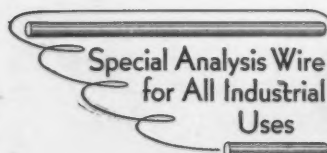
This is just one place where many tons of Keystone's war-time production is going. And too . . . planes, tanks, guns and ammunition place upon us heavy calls for materials.

Keystone wire and rods for civilian products must come second to these demands—until Victory.



**Remember—  
Steel Mills  
Need SCRAP  
and MORE  
Scrap!**

**KEYSTONE STEEL & WIRE CO.**  
PEORIA ILLINOIS



### NEWS OF INDUSTRY

viously should be done as promptly as possible.

#### II—Allotments, Numbers, Symbols, Certifications

• CMP Regulation 5 provides certification for orders for controlled materials. This certification does not require that a rating or allotment number be shown. The rating is given by Regulation 5 but no allotment number. A mill has found manufacturers reluctant to accept orders without an allotment number. Are such numbers necessary?

ANSWER—The symbol MRO attached to a properly certified purchase order identifies the order as an Authorized Controlled Material Order and such order is equal in status with an order bearing an allotment number.

• (a) Should warehouses accept certification given in CMP Regulation 7 instead of the certification given in CMP Regulation 4?

ANSWER—Yes.

• (b) Should mills accept certification made in accordance with CMP Regulation 4 in place of other certifications?

ANSWER—No, the certification made in accordance with CMP Reg. 4, is not applicable to orders placed directly with mills.

• It is reported that S-3 has been divided into 36 individual programs, using letters J, B, and several others. Is it necessary that the mill show allocation classification symbols on these new CMP allotment numbers?

ANSWER—In the third quarter each individual program formerly designated S-3 will be indicated by a separate symbol. The end use classification symbols heretofore used have been discontinued.

• The quantity of copper requested by a manufacturer of B products on his CMP-4B application is considerably reduced by the supervising Industry Division. Under such circumstances how may a manufacturer appeal for an additional amount?

ANSWER—He should file a letter in triplicate with the Industry Division setting forth the pertinent facts and the reasons why he considers himself entitled to the amount requested in his CMP-4B, paragraph (x) of CMP Regulation 1. The Copper Division does not participate in the distribution of copper to individual manufacturers.

• A manufacturer purchases Class B products to round out his line within the meaning of CMP Regulation 3 (b) (1). How does he use his rating?

ANSWER—A Class B product manufacturer may purchase Class B or other products to fill out his line, if they are not more than 10 per cent of his total volume of sales, by applying the allotment number and preference rating which he has received for his own authorized production schedule. If they are not



# PARISH

## METAL STAMPINGS

★  
MODERN  
DESIGN  
AT  
LOW COST  
★



### HOUSEHOLD APPLIANCES

New refrigerators, cabinets, bathtubs, stoves, and a wide range of other household necessities will be a joy to the post-war housewife.

Pressed Metal Parts and stampings will make possible unparalleled efficiency, smart beauty, long life,—all those qualities that lower sales resistance in a competitive world.

No other method provides *all* characteristics required,—resistance to elements, ability to take hard knocks in every day use, relative low cost, tensile strength, beauty and so forth. Parish Pressed Steel has completely rounded facilities; engineering cooperation in the drawing board stage, all sizes of presses for most efficient production, welding facilities, painting and finishing departments, and full assembly facilities.

It is not too early to plan your new designs. We are ready to work with you in the preliminary stages.

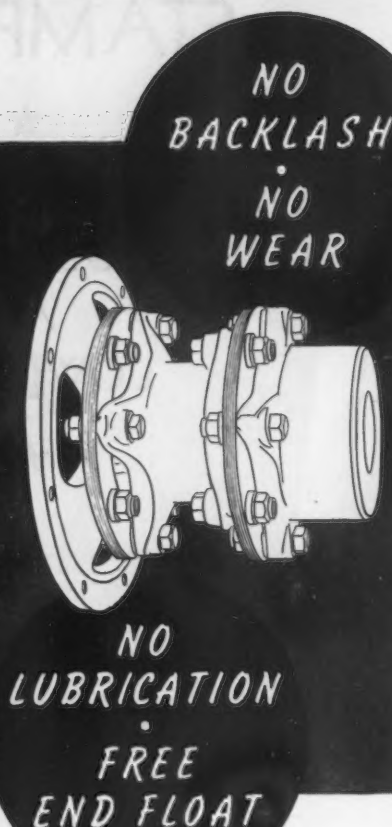
[[ And as our contribution to post-war progress, we are now equipped to stamp, fabricate, and heat treat aluminum, in addition to steel. ]]



PARISH PRESSED STEEL CO., Reading, Pa.  
Subsidiary of SPICER MANUFACTURING CORP.  
Western Representative: F. Somers Peterson, 57 California St., San Francisco, Cal.

# THOMAS FLEXIBLE COUPLINGS

## Especially Built for Diesel Engines and Large Motors



**U**nder heavy operating loads, Thomas Flexible Couplings have given 29 years of maintenance-free service. Their design is especially suitable for Diesel engines and large motor installations where loads are subject to heavy pulsations. Thomas Couplings not only have high load carrying capacity, but they also have flexibility for angular and parallel misalignments. Thousands of installations in all parts of the world, on land and sea, give testimony to the outstanding value of this no backlash, no wear, and lubrication-free type of coupling. Write today for catalog with complete engineering data.



**THOMAS FLEXIBLE COUPLING CO.**  
WARREN • PENNA.

### NEWS OF INDUSTRY

more than 10 per cent, he buys them all under the provisions of CMP Regulation 3, paragraph (f), sub-paragraph (4), or he uses the distributors' PD-1X application.

#### III—Scheduling, Delivery, and Preference of Orders

- The mill may have on its books an order giving a definite delivery schedule when a CMP allotment number is received showing a different delivery schedule. It is assumed that the schedule under CMP will govern. Is this correct?

ANSWER—The schedule of delivery required by the allotment number of the CMP order will govern.

- MRO orders are coming to the mills without any designation for the month, although they usually request delivery in a certain month. Can the mill insert the number of the month in which delivery is requested?

ANSWER—Yes, the mill should specify the month in which delivery is requested in reporting on Form PD-59E.

- No provision has been made under CMP to allow the mill to ship small orders without prior approval of the WPB. Under PRP the mill was given a tonnage it could ship on small orders without prior approval of the WPB. Is allowance to be made for this?

ANSWER—Authorized Controlled Material Orders properly accepted may be shipped by mills without securing approval from the WPB, irrespective of tonnage.

- Is it proper for consumers of brass mill products to give brass mills orders with delivery dates extending over a long period of time with only parts of the orders covered by CMP allotments?

ANSWER—Yes, but only that part of the orders covered by CMP allotments may be produced and delivered.

- If our production schedule is filled, what authorization must be obtained to allow us to produce an emergency order ahead of other orders required during the same month?

ANSWER—No authorization need be obtained to produce an emergency Authorized Controlled Material Order properly accepted ahead of other orders during the same month; however, if the production schedule is filed, authorization must be obtained to accept an additional order for that particular month.

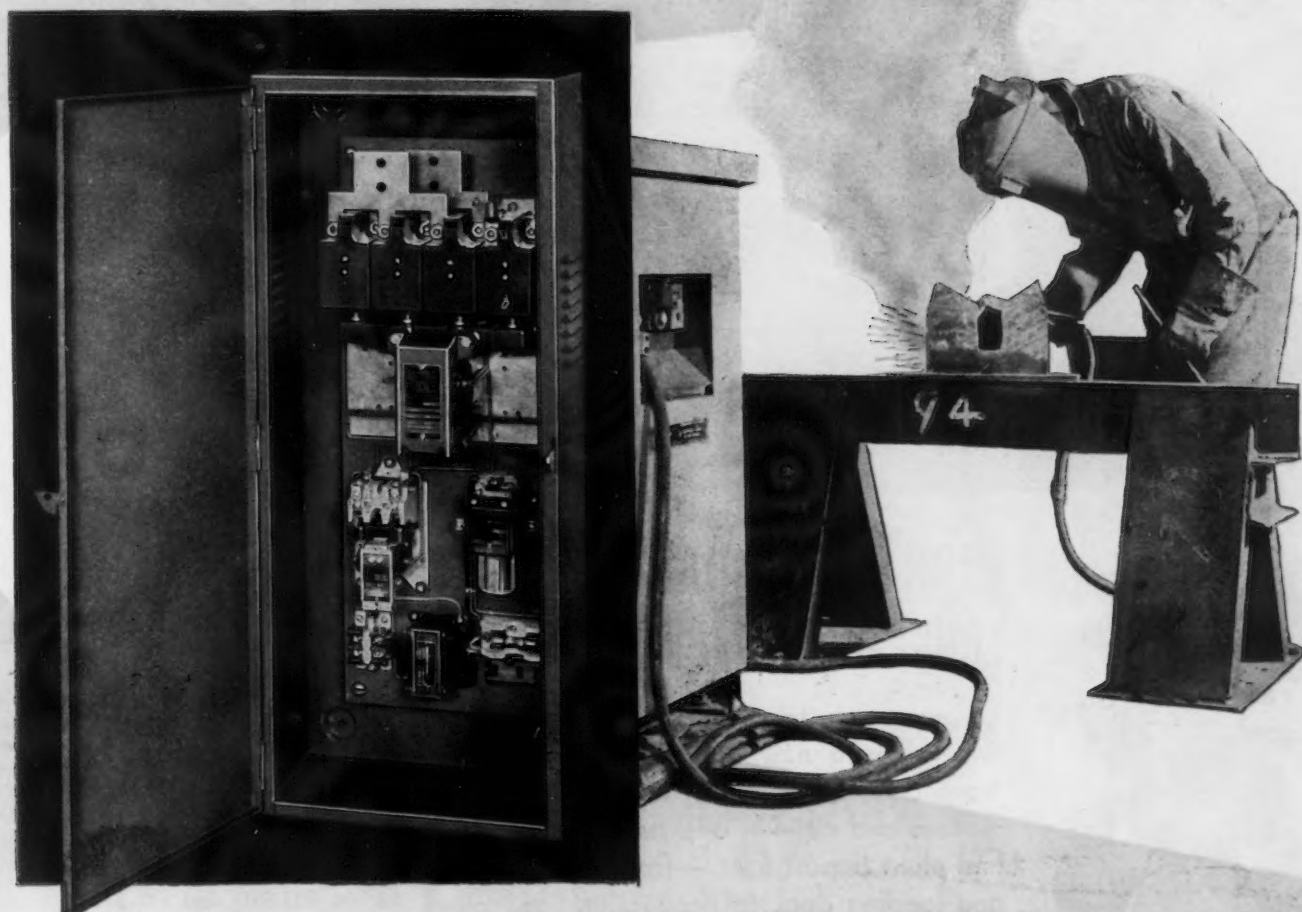
- If we received two Authorized Controlled Materials Orders on the same date from two separate agents, what factors would control the sequence of production, assuming that both require delivery in the same month?

ANSWER—There are no regulations governing the schedule within a month of Authorized Controlled Materials Orders. This is a matter to be worked out with the customers.

- What action is to be taken with Authorized Controlled Materials Orders which are received too late to be



# SQUARE D *Announces* SAFETY CONTROL FOR A.C. ARC WELDERS



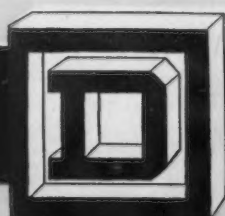
**Protects operators by automatically disconnecting welding transformer when arc is broken . . . .**

**H**IGH open circuit voltages of A.C. arc welders (transformer type) create a definite hazard to operators. Physical contact from electrode to grounded metal surfaces (when not welding) is sometimes serious.

Square D's new class 8992 safety panels eliminate this hazard by automatically disconnecting the welder transformer after the arc is broken. The transformer is automatically reconnected the instant the operator touches the electrode to the work. Thus, the arc is struck with no delay. There is no loss in operating speed or efficiency.

There is an economy angle, too. When Square D safety panels are used, the welding transformer primary circuit is connected to the power line only while the arc is held. Substantial saving in power is effected when a number of welders are used on a single power system and the power factor is improved.

These new safety panels can be used with any make or model of A.C. transformer type arc welder. External connections are simple and internal connections of the welder need not be disturbed.



ELECTRICAL EQUIPMENT

KOLLSMAN AIRCRAFT INSTRUMENTS

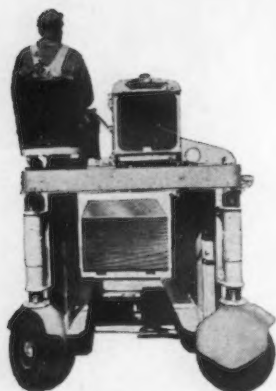
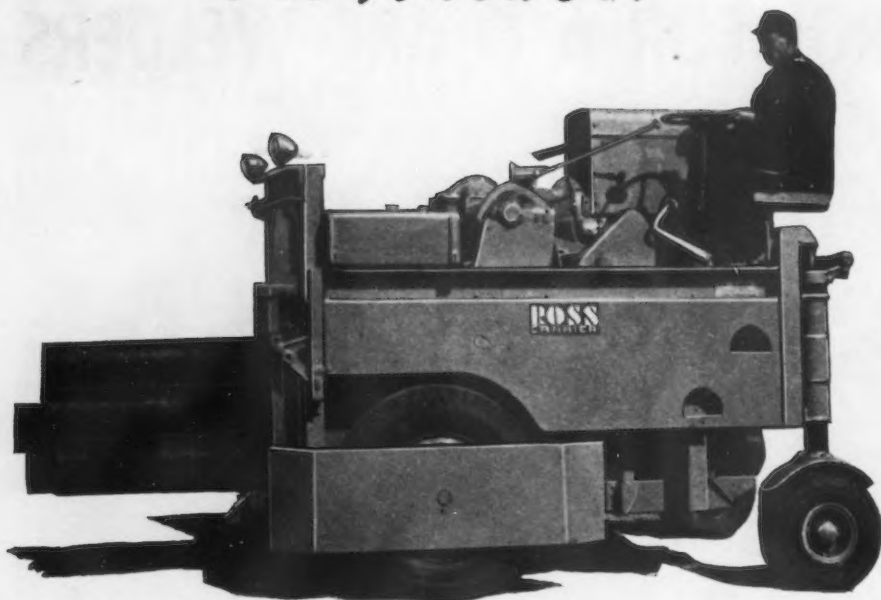
**SQUARE D COMPANY**

DETROIT

MILWAUKEE

LOS ANGELES

*the Answer:*



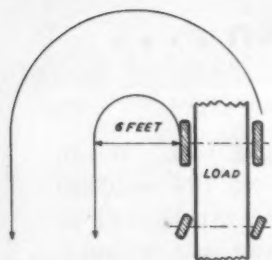
## HIGH-SPEED HANDLING of LONG--HEAVY--BULKY LOADS

To many industrial plants the Ross Carrier brings a new conception of rapid transportation of heavy, bulky materials, indoors and out—in and between plants and plant departments—from warehouse and loading dock to production line.

### ROSS "70-H" CARRIER

Here's speed and economy in handling unit-loads up to  $4\frac{1}{2}$  tons. Rugged, smooth plated frame protects the load, as well as materials stacked along runways. Low overall clearance is provided by special mounting of heavy duty 50 HP gasoline motor. Driver's seat located to permit clear visibility in all directions.

Our engineering staff is at your service, ready to help you plan an efficient handling system for the future. Write for Bulletin 1-63.



**Extra - Short Turning Radius**  
Six-foot inside turning radius possible with a full load. Differential-type steering permits fast, efficient maneuvering in congested areas.

THE ROSS CARRIER COMPANY, BENTON HARBOR, MICHIGAN



produced during the month specified? This may be caused either by a long manufacturing cycle, or too short a time limit to secure authorization to produce.

**ANSWER**—This is provided for in Schedule III of CMP Reg. 1, which provides a time limit of 45 days for non-refractory alloys, and 60 days for refractory alloys, for placing purchase orders with the mills. Orders need not be accepted if they are not placed within these time limits.

#### IV—Reporting Forms

• Regarding Form PD-59E: How much longer is it planned to use this form?

**ANSWER**—Not yet determined, but will be used throughout the second quarter in any event.

• Should orders from re-rollers and re-drawers be reported on this form?

**ANSWER**—Orders from re-rollers and re-drawers are not to be reported on this form.

• On what form should warehouses report actual deliveries made during the month of April? (PD-123 is not suitable for reporting CMP deliveries.)

**ANSWER**—Form PD-123 is to be used for deliveries on other than Authorized Controlled Material Orders bearing preference ratings on AA-5 or better and giving end-use information, and a new Form PD-123D for reporting CMP deliveries.

• Certain orders have been applied for on PD-59D and after allotments have been received they have been applied for the second time on PD-59E. How can these duplications be straightened out?

**ANSWER**—Form PD-59E has a column in which statement should be made that the order had been previously authorized on Form PD-59D.

• It is now required that we file Form PD-59E's four times monthly. What time cycle will WPB require to process these forms? Also, will authorization to produce be given to us four times, or will all forms be grouped and returned ten days before the commencement of the month in which delivery is to be made?

**ANSWER**—This question is answered by Direction No. 4 to CMP Reg. 1, which obviates the necessity for securing approval on Form PD-59E.

• What provisions have been made, or will be made, to discontinue the report of zinc shipments on PD-94A by preference rating?

**ANSWER**—Form PD-94A will be used to report March deliveries. A new form for the reporting of April and subsequent deliveries is in preparation and if this is not available by the required date, detailed instructions will be issued by the Zinc Division.



# Electroweld

# Steel Tubing

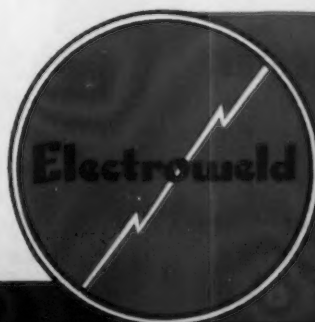
**SAVES WEIGHT AND MEETS  
YOUR SPECIFICATIONS**



## Used where performance factors are vital

When there's an extra premium upon increased as well as sustained production, specification accuracy which is dependably maintained becomes of ever increasing importance to you. The solution to that need is found in Electroweld Steel Tubing. It is lighter in weight without sacrificing strength; hence, forming, cutting, and welding operations become decidedly faster and easier. No other method of tube manufacturing can provide you with such uniform wall thickness. Furthermore, the physical and chemical properties throughout the wall can be provided exactly as specified, thus meeting your most exacting requirements at all times. The excellence of surface and uniformity of diameter provide you with additional production advantages.

These Electroweld benefits are the result of manufacturing tubing of accurate-to-specification strip steel on America's latest and most modern tube mills. Every foot of every length of Electroweld Tubing is hydrostatically tested for safety and meets Government, A.S.M.E., as well as A.S.T.M. specifications. Today we serve the Armed Forces with tubing which has these benefits, and we trust that after the war you will take advantage of Electroweld's outstanding qualities.



### SIX ADVANTAGES

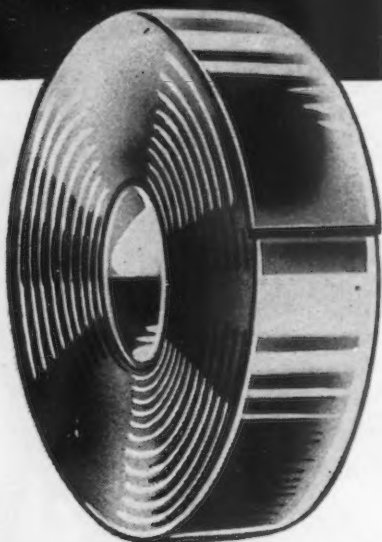
- Uniform diameter
- Uniform wall thickness
- Uniform physical properties
- Test-proven welds
- Scale-free, silver-bright finish
- Square cuts, minimum burr

## Electroweld STEEL • OIL CITY, PENNA.

A Division of TALON, INC.

**Manufacturers of pressure and mechanical steel tubing**

# SUPERIOR



**HOT and  
COLD ROLLED  
STRIP STEEL**

**Carbon-Alloy  
STAINLESS  
and  
SuVeneer Clad Metal**

**SUPERIOR**  
STEEL CORPORATION  
CARNEGIE, PENNA.

## How a B-Product Producer Operates Under the Controlled Materials Plan

### New York

• • • How producers of Class B products should operate under CMP and the advantages of the use of a Master Sheet to control purchase orders was outlined in admirable detail by Harold V. Chrisholm, purchasing agent of the Walworth Co., Boston, in an address before the National Assn. of Purchasing Agents meeting in the Hotel Waldorf-Astoria last week. Mr. Chrisholm's instructions to Class B producers, in part were as follows:

### Preference Rating Pattern

The preparation of our Preference Rating and Claimant Agency Pattern is a task where the assistance of our accountant can be very helpful. We—in the Walworth Co.—copy the preference ratings and allotment numbers from our incoming customers' orders to our own order forms and invoices. Our accounting department then manually sorts many thousand

invoices a month in the following steps:

1. First, the ratings are sub-divided by Plant.
2. Invoices are sorted daily by Claimant Agency.
3. Each Claimant Agency pile is then sorted by preference ratings.
4. Each rating is then sorted into product groupings.

Totals are taken off each day onto paper slips punched for posting on a peg-board—from which monthly totals can conveniently be taken off at the end of each month. We have found by actual experience that this manual sorting and peg-board control is more effective for our job than any mechanical tabulating we have tried—possibly because of the number of our own different product classifications.

Having now arranged for these important sources of information, our purchasing agent should consider the following factors necessary in the preparation of the CMP 4-B form:

The Determination of the Produc-

**VICTORY TEAM:** Theresa and George Medowski are one of the twenty married couples employed at the Duquesne works of Carnegie Illinois Steel Corp. Theresa is "racking" steel bars in a cradle at the end of a sheer line. George, making a ladle stopper in the open hearth department, likes the idea of his wife working at the same plant.





# WE HAVE EXTRA FOUNDRY CAPACITY FOR BRASS OR BRONZE CASTINGS



## WE CAN SUPPLY THEM IN A HURRY!



**MUELLER**  
**BRASS CO.**  
PORT HURON, MICH.

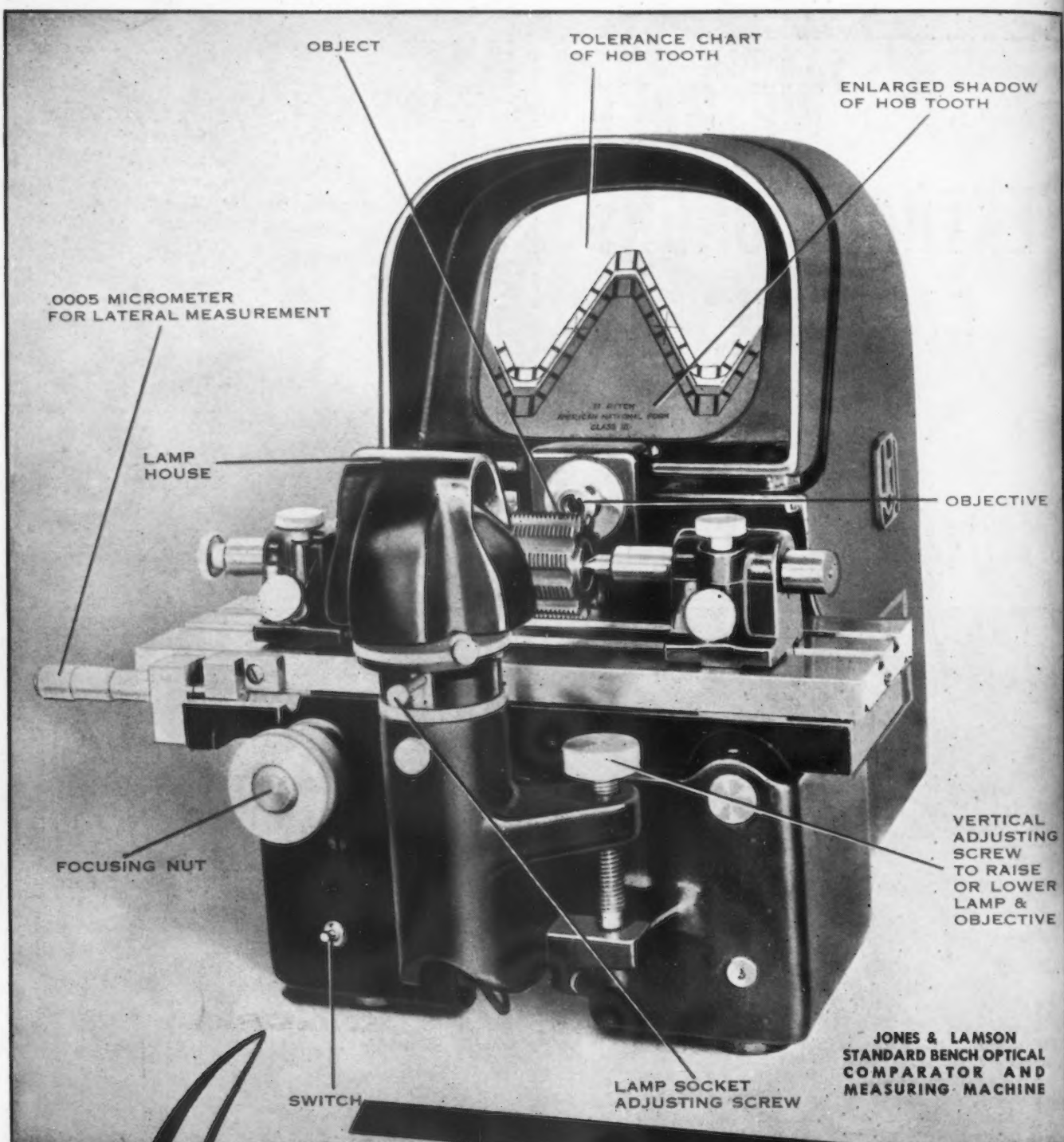
● At the present time we have ample capacity and equipment for the manufacture of brass or other copper base alloy sand castings.

In addition to the most modern equipment we have experienced men who have been in our foundry for years. These men have the "know how" for the production of close tolerance work. The castings produced are of uniformly high quality with close grain structure.

We have our own Tool Room and Pattern Shop for any necessary tools or patterns to turn out the job. We can supply them rough, machined, polished or plated.

We manufacture the standard line of STREAMLINE pipe fittings for heating, air conditioning, water works, plumbing or refrigeration use, or to your specifications.

If you need castings in a hurry, write us now.



JONES & LAMSON  
STANDARD BENCH OPTICAL  
COMPARATOR AND  
MEASURING MACHINE

## A complete, economical inspection system

For inspection and measurement in the toolroom or for comparison inspection of production parts with a master chart or template, the economy of inspection by Optical Projection with Jones & Lamson Comparators is beyond question.

Errors are immediately detected, thus they can readily be corrected, and the loss of much valuable time eliminated.

There is a Jones & Lamson Optical Comparator for every need in the field of inspection by Optical Projection, and our inspection engineers are ready to study your inspection problems and make recommendations based upon more than twenty years experience in this field.

**JONES & LAMSON MACHINE COMPANY**  
SPRINGFIELD, VERMONT

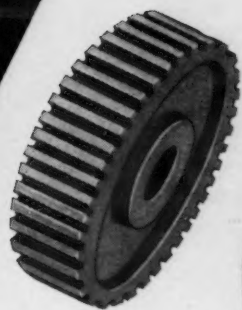
Manufacturers of: UNIVERSAL TURRET LATHES • FAY AUTOMATIC LATHES • AUTOMATIC THREAD GRINDERS • OPTICAL COMPARATORS • AUTOMATIC OPENING THREADING DIES.



PROFIT-PRODUCING  
MACHINE TOOLS



# INGENIOUS DESIGNING NETS SALEM CUSTOMER 2 MILLION POUNDS PER MONTH . . .



## GIVES 30% EXTRA PRODUCTION

Designed and built in 1935 for peacetime production, this Salem Continuous Pusher Type Furnace is now meeting increased war production demands which are FAR in excess to the original requirements. The furnace has a double chamber—one for hardening small forgings or stampings, and another chamber for drawing, and both chambers can be used for normalizing. There is a common center wall to save heat loss. All firing is done on one side of each chamber, and due to the furnace design, excellent heat uniformity is provided. Scale is held to a minimum. ♦ One man feeds material into

the hardening chamber. The parts are discharged from inside this chamber through a special chute which carries them onto a conveyor in the quench tank. The conveyor supplies another man with quenched parts which he places into the drawing chamber. This equipment, producing as much as 2 million pounds per month on various operations, nets our customer 30% higher production than he expected. And, remember, please, that during many years of this efficient production service, there have been no major repairs. Write Salem today for the answer to your heat treating problem.



# SALEM ENGINEERING CO. • SALEM, OHIO

tion Schedule of the plant is based in turn on calculating capacity operations in the case of critical components. Here, we adjust our past production records to present facilities and obtain the approval of our production executives for the resulting schedule.

The Determination of the Purchase Schedule can be greatly facilitated if all controlled materials are requisitioned through a central stores department with a stock record card

control. This conveniently permits an item by item review—to insure conformance with the 60-day inventory limitation—as well as to provide data for computing our purchase schedule.

The Determination of the Production Requirements of the plant are calculated on a very simple basis. Our purchasing agent obtained from the accounting department—from existing records—the percentage by weight of the various controlled materials

entering into each of our own products classes during the year 1942. By applying these percentages to our proposed production schedule, our production requirements are easily calculated without the necessity of preparing bills of material for each size and item. Our Industry Division — of course — has on file prototype percentage figures against which these calculations may be checked.

We will—periodically—request our accountants to adjust these percentages so that if our requests for material vary in increased amounts from the prototype—as might be the case with new products—we will then be in a position to justify the variation to the Industry Division.

### Placing the Purchase Order

After having submitted our Form CMP 4-B and received approval to purchase, receive and produce, we have several procurement factors to consider:

1. Whether or not we operated a central stores department we would consider it advisable to adjust the ordering point of each item so as to give proper consideration to inventory limitations, lead time and our approved production schedule.
2. We find it advantageous to determine in our purchasing department the delivery schedule of controlled materials.
3. The type of card recommended by the WPB for the control of allotments—and adapted to a visible index type of file—has worked very satisfactorily for our purposes.
4. Since we are required to regulate purchases of other production materials—so that they will not be greater than the quantity necessary for the Production Schedule, we have set up similar cards with a running total of the dollar value of these B-product groups.

Purchase Orders for Controlled Materials are placed for future delivery up to the quantity allotted—and in this connection—the use of a master sheet listing all production materials is recommended—one which will indicate at a glance the inventory position of each item—the quantities on order — the quantities required each month, and the vendor's shipping schedule.

When placing purchase orders from 9 to 12 months in advance—with such a master sheet as a guide—we are better able to review the picture each month to determine whether the required shipping schedule should be advanced or deferred.

Incidentally, we find that the use of the CMP monthly designation as a suffix to our purchase order numbers such as 18, 19, 20, etc., is help-



**F**ROM quartz crystals to tank turrets there's scarcely an article used by our armed forces on which some type of abrasive is not used. Grinding, polishing, buffing and lapping are essential operations in practically every war plant. And the Abrasive Manufacturers of the U. S. A. are working 24 hours a day making sure that not a single piece of vital material is held up through lack of abrasive grains.

The General Abrasive Co., Inc., is furnishing LIONITE and CARBONITE electric furnace abrasives to most of our war industries. Thousands of grinding, polishing, buffing and lapping operations are using these abrasive grains in their original form or in well known makes of grinding wheels and abrasive paper and cloth.

One of the largest manufacturers of abrasive grains, the General Abrasive Co., is 100 per cent converted to war production. Some day these tough, uniform abrasives will again be available for production of our civilian necessities but until that day arrives, they grind and polish only for Mars.

**GENERAL ABRASIVE CO., INC.**  
NIAGARA FALLS, NEW YORK U. S. A.





# experience *built by* 74 years of pneumatic engineering *now available to you, too!*



Perhaps you've never thought of it that way . . . but every time you ride a train you get a practical demonstration of the flexibility, simplicity and effectiveness of pneumatic remote controls.

Each demonstration certifies the three-quarters of a century of Westinghouse Air Brake Company experience behind these controls . . . experience that is now available to you.

Stimulated by the needs of war, W·A·B Remote Control Systems are already at work in new and broader fields. They are helping to improve output and better performance in Marine, Earth Moving, Mining, Petroleum, Lifting, Conveying, and Factory equipment.

One tremendously important current application, for example, is in ships. The W·A·B Control Systems concentrate command of all engine maneuvering in a few small levers grouped in control stations located on the bridge, in the engine room . . . or both. Control of the ship is almost as centralized and simplified as the control of your car.

Speeds of individual engines can be varied and synchronized to hair-line limits; the smallest movement of the graduating lever is reflected by a proportionate movement of the engine-room controls, with no lost motion, back-lash, or play. In any cycle

of operations such as speed reduction, declutching, braking, reversing, clutching and pick-up, *timing* is at the will of the operator — but *sequence* cannot be varied through ignorance or carelessness. Safety and limiting devices are directly and positively interlocked, without the need for complicated auxiliary mechanisms.

Examples like this are not intended to define your specific use of W·A·B Remote Control Systems . . . but merely to suggest their almost limitless possibilities. In many cases, control problems have been solved by the use of standard "off the shelf" W·A·B devices.

You and your engineers can tell, better than anyone else, where W·A·B Remote Control Systems — Pneumatic, Pneumatic-Electric, or Pneumatic-Hydraulic — would fit into your plant or your product. Our representatives will be glad to focus W·A·B experience on the development of a system engineered to your exact requirements. Phone, wire or write.

Westinghouse Air Brake Company

INDUSTRIAL DIVISION

General Offices: Wilmerding, Pa.

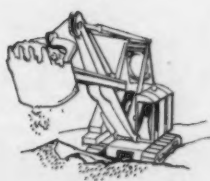
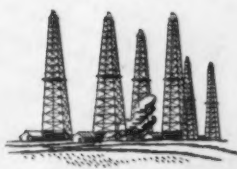
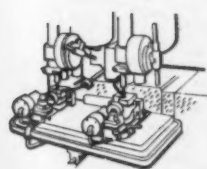


74 Years of Pneumatic Control Experience

**W·A·B**

PNEUMATIC  
PNEUMATIC-ELECTRIC  
PNEUMATIC-HYDRAULIC

## Remote control systems



# **"The Speedslinger"**

## **Is the Heart of Our Foundry"**

SAYS W. F. GOLLMAR, VICE PRES. AND GENERAL MANAGER, ELYRIA FOUNDRY



Speedslinger equipped jobbing foundries frequently employ the B&P Portable Sand Conditioner when elaborate sand handling systems are not practical. This inexpensive unit is capable of screening, tempering, magnetically separating and pilling 20 cubic feet of sand per minute. Elyria Foundry uses two Portable Sand Conditioners, one of which is shown here with method of loading and Speedslinger portable tank.



## The Better Method in this large gray iron jobbing foundry makes castings ranging in size from 1 pound to 80,000 pounds

Both Speedslinger and Speedmullor, as well as two Portable Sand Conditioners and four Screenarators, are products engineered and installed by The Beardsley & Piper Co. for the Elyria Foundry. And when W. F. Gollmar says "the Speedslinger is the heart of our foundry," he knows whereof he speaks. His experience with the Better Method of ramming dates back to 1925 when they installed a Portable Type Sandslinger which was replaced in 1929 by a Motive Type Sandslinger which paid for itself many, many times, according to Mr. Gollmar.

Since satisfied users are the truest endorsement of any foundry equipment, why hesitate to consult a Beardsley & Piper Co. engineer about foundries like yours, making the same kind of castings as you are making. Most frequently, we are able to reduce costs and speed up production.

**THE BEARDSLEY & PIPER CO.**  
2541 N. Keeler Avenue, Chicago, Ill.

The Motive Type Speedslinger at Elyria Foundry rams 250 tons of sand in 5 hours, producing gray iron castings from molds three feet square up to molds 12 feet wide by 24 feet long, including pit molds and large copes. On one job where they formerly got three castings weekly from two patterns, the Speedslinger now makes three castings daily from one pattern.

This Morton Milling Machine casting was Speedslinger rammed at Elyria Foundry.



ful in checking the scheduled delivery of numerous orders.

The Control of Receipts has been arranged for by the purchasing agent with the executive responsible for receiving material into the plant. We have found that a visible index type of card set up for each classification of controlled products with the total allotment on each card is very satisfactory. The purchasing agent can insure correct posting by the receiving

department by use of a code number on the receiving department copy of each purchase order corresponding to a code number on the product cards. The receiving department should be instructed to warn the purchasing department when allotments have been approximately 90 per cent applied—to permit the purchasing department to stop further shipments not already in transit or obtain additional authorization.

## Trade Notes

H. E. Eaton Co. announce removal of their offices to 1180 Raymond Blvd., Newark, New Jersey.

Smith, Hinchman & Grylls, Inc., are expanding their tool engineering division to include complete coverage of that field.

J. H. Williams & Co. have moved their general sales office of the tools division from New York to 400 Vulcan Street, Buffalo. A district sales office will be maintained at 225 Lafayette Street, New York.

Fruehauf Trailer Co. has leased a plant formerly occupied by the U. S. Heater Co. at Bessemer, Ala., for conversion into a trailer assembly plant.

W. B. Lawson, Inc., Cleveland, announce that they will distribute Merck reagent chemicals and acids.

Ilg Electric Ventilating Co., Chicago, will build a new research laboratory apart from the present plant at 2850 North Crawford Ave., Chicago.

Waukesha Tool Corp., Waukesha, Wis., has acquired the former plant of the Palmer Products Co.

Alloy Products Corp., Waukesha, Wis., to increase war production facilities has taken over the plant formerly occupied by Creamery Package Co.

Merchants & Manufacturers Securities Co. has purchased the following tool manufacturing concerns through its subsidiary, Domestic Finance Corp.: Siewek Tool Co., Progressive Tool & Cutter Co., Ferndale, Mich.; and the Siewek Tool & Engineering Co., Hartford, Conn.

Principal Die & Stamping Co. has moved to a new plant in Chicago. This company is the exclusive manufacturer of the new dies to be used by the U. S. Mint for copperless, steel pennies.

Electronic Mechanics, Inc., Clifton, N. J., has bought a new plant in Chicago.

Sylvania Electric Products, Inc., Salem, Mass., has rented a warehouse in Chicago. It will be a main distribution center.

Walker Electric Supply Co., Terre Haute, Ind., has been made distributor of Allis-Chalmers welding equipment in western Indiana and eastern Illinois.

Lempco Products, Inc., Bedford, Ohio, has purchased the Evans Flexible Reamer Co., Chicago. The new corporate title will be Evans Reamer & Machine Co. The Evans factory will continue at 4541 Ravenswood Ave., Chicago.

B. N. Brockman has been made vice-president and general sales manager of R. K. LeBlond Machine Tool Co., Cincinnati. Neal Jenkinson has been made secretary in addition to his work as assistant treasurer. General purchasing agent, William Reis, has been appointed assistant secretary. All three men are veterans with the company.

Arnold Tietig III, former vice-president of the Metal Specialty Co., Cincinnati, has been elected president, succeeding the late Vernon B. Chase. He has been associated with the company for the past nine years and held the office of treasurer as well as vice-president. He will continue as company treasurer.

## NEED EQUIPMENT

for...

# Galvanizing?

(Electro Process)

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# Plating?

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# Cleaning?

... ASK MEAKER!

# Pickling?

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Do It MECHANICALLY—Save Labor, Up Production!

## The MEAKER co.

1635 SO. 55th AVE., CHICAGO





## The creature no one knows...

IN THE HALF-WORLD between day and night, an eerie, sinister creature emerges from hiding. Its ancestry is unknown. It is the bat, the only mammal which flies. Of all the creatures known to man, bats are the most mysterious. They do not mate when other animals do. And no one knows where they go at migration time.

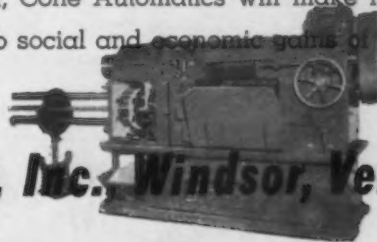
Yet bats are the most highly specialized mammals on earth. If we had the intricate ears of bats, we could hear an ant walking. If we had their incredible coordination, we could fly at the speed of a locomotive toward a telephone wire...at dusk...yet miss it! Or dash blindfold around hundreds of objects and not touch one!

But if you think that's specialization, listen to this:

The production giant of the machine tool industry—Cone's multiple spindle automatic lathe—can do as many as 8 different jobs simultaneously...in a matter of seconds...or perform as many as 17 different operations on a part—more than one every two seconds—with the deftness of a master craftsman!

The prime task of Cone Automatic Machines today is to help speed war production. In the future, by making possible increased production, they will increase purchasing power...and so increase employment. As a result, Cone Automatics will make major contributions to social and economic gains of the future.

**CONE Automatic Machine Company, Inc. Windsor, Vermont**



## Navy Calls for Salvage Officers

### New York

• • • An official release this week by the Navy Department emphasizes the Navy's need for a group of men who can qualify as officers in its program for reclamation of scrap metals and salvaging war materials. The qualifications and procedure are outlined in the following.

### Qualifications:

1. A college degree in metallurgy or metallurgical engineering is desirable.
2. Candidates should have had three or more years' experience in the salvage or reclamation of scrap metals or used materials. In lieu of salvage experience con-

sideration will be given to candidates who have had three or more years' experience in the production of metal equipment, machine shops or in the handling and use of heavy industrial equipment.

3. Candidates who do not meet qualifications of paragraph 2 may be considered if they have had,

A) Two years college work in metallurgy or metallurgical engineering, or

B) A background of experience in engineering shops or steel or smelter plants.

Candidates selected will be given a course of instruction in connection with the duties to be carried on by them. These men will be assigned to duties both within and beyond the continental limits of the United States.

**Age Bracket: 27 to 43 years.**

All candidates must meet Naval physical requirements and possess officer-like qualities. Application should be made to the nearest Office of Naval Officer Procurement. These offices are located in principal cities throughout the United States.



### Thru World Wars I and II

## A.C.P. PROCESSES HAVE DONE THEIR BIT

### In giving more and better HELL to the enemy

ACP Chemicals and Processes, plus the facilities of a well-equipped laboratory staffed with technological experts skilled in the mass production and processing of all kinds of metal, are at your service to help you turn out more and better war equipment

—ships, tanks, guns, bombs, shells and other accessories.

Wherever metal has been fabricated all over the world, ACP has pioneered in the supplying of chemicals and processes to facilitate production and perfect the surfaces of metal for final finish.

**RODINE**—an acid inhibitor, **DEXODINE**—an acid cleaner, **CUPRODINE**—for copper coating to facilitate drawing, **KEMICK**—for painting exhaust manifolds. These are but a few of the chemicals that have been factors in speeding the production of better products. Consult with us on your metal treating problems.

**AMERICAN ACP CHEMICAL PAINT CO.**  
MAIN OFFICE AND WORKS  
AMBLER, PENNA.



DETROIT, MICH., 6335 Palmer Ave. E.  
CANADIAN BRANCH  
WALKERVILLE, ONT.

## SWPC Plan in Ohio Meeting With Success

### Cleveland

• • • A plan to have large war plants in this area which have heavy backlogs of orders share these orders with small and distressed plants on a subcontracting basis, handled through the Smaller War Plants Corp., is meeting with considerable success, according to Daniel B. Ford, regional SWPC director. The plan has been so successful in the Cleveland area that it will be extended to the rest of the SWPC region, which includes all of Ohio, Kentucky, West Virginia, and western Pennsylvania.

Several large plants voluntarily have used the SWPC services for the placement of subcontracts or to require SWPC certification of need before making subcontract awards, while others have placed specifications at the disposal of the SWPC and given it a free hand on certain types of work. Several million dollars in subcontracts have been already made available so far.





# Yes WE DELIVER ON TIME

No holding up vital jobs while you wait for your grinding wheels or mounted wheels\*.

Timing and scheduling are everything now. That's why our streamlined QUICK SERVICE is such an important asset.

Fully approved and endorsed by W P B, here's our war-time speed setup:

- Manufacture only wheels 3" in diameter and under. To speed production, larger sizes are eliminated for the duration.
- No quitting whistle. We are on the job making wheels 24 hours a day, every day.
- Our central location brings us closer to many plants.

No time lost in transfer connections or long distance shipping.

## CHICAGO GRINDING WHEELS

*The wheels of proved quality—known for performance, cutting and long life.*

*Any shape, grain and grade, any size up to 3" in diameter. From this army of wheels you can select one custom built for your job.*



**TRY ONE**—Tell us the kind of equipment, the job, and size wheel you want to try. We'll send it postpaid.

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## CHICAGO WHEEL & MFG. CO.

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\*Half a century of specialization has established our reputation as the Small Wheel People of the Abrasive Industry. You can bank on us.

Send Catalog. Interested in		Name .....	
<input type="checkbox"/> Grinding Wheels		Address .....	
<input type="checkbox"/> Mounted Wheels		Size .....	
<input type="checkbox"/> Send Test Wheel			

RA-6



# "SECOND GEAR" or "low gear" for the tough spots

*"fluid drive" welding on the straightaway!*

● **JUST ONE ADJUSTMENT** gives exact welding current desired. No "nuisance gadgets"—exciters, rheostats or reactors.

● **ARCONTROL** gives choice of three types of arc.

● **NO "DROOP"** in welding current when machine warms up. Just pre-set—and *weld!*

● **BUILT TO "TAKE IT"!** Banging can't damage heavy, one-piece seamless steel frame! No tin boxes—all vital parts are *inside*.



## Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

Here's new, handy power for those tough jobs—with the same timesaving, rock-steady pre-set current adjustment that only Flexarc welders give you!

It's **ARCONTROL**. This new welding feature, combined with Westinghouse single, pre-set current adjustment—is just what your operators have always wanted. It provides simple current control—flexible enough to tackle any job.

New **ARCONTROL** brings you a choice of **THREE** optional ranges of operation. "Normal" range, like fluid drive, gives you fast, flexible operation that meets most conditions. "A" and "B" ranges, like second and low gear, provide reserve ranges of power for unusually tough conditions.

Speed your operator training by specifying easy-to-operate Westinghouse D-C Welders. Write for complete details. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

J-90470

## FLEXARC WELDERS



## More Output and Better Quality Key Topics at Electric Metal Session

Canton, Ohio

• • • More than 75 Canadian and American electric furnace men who have helped make America's weapons the best in the world, met June 4 and 5 in Canton at the 11th annual conference of the Electric Metal Makers Guild, Inc. The conference divided into discussion sessions on casting and ingot production were closed meetings, dedicated to production of more high quality steel from existing units.

The theme throughout the meetings was higher production with a maintenance of quality. Harry F. Walther, president of the Guild and chief melter at Timken Steel and Tube Co., stressed the importance of quality in the face of critical shortages of alloys, scarcities of scrap, low quality in scrap, and other difficulties. Such problems cannot be used as reasons to ease on quality or quantity of electric furnace steel.

Dr. Walter G. Hildorf, chief metallurgical engineer at Timken Roller Bearing Co., pointed out that the present developments in metallurgy will have a profound effect on the use of steel during the remainder of the war and in the post-war period. The hardenability features of various steel grades will take precedence over chemical analyses in steel application.

The technical meetings of the Guild, closed to all except members, met in four sessions, two each on casting production and ingot production. Edward J. Chelius of the Duquesne works of Carnegie-Illinois Steel Corp., was chairman of one panel devoted to ingot production. The papers presented were:

"Method of Charging the Furnace to Improve Melting Time or Speed," by Mathias Meinen, Crucible Steel Co., Midland, Pa.

"Hot Metal Preparation and Duplexing," by R. J. McCurdy, Republic Steel Corp., Chicago.

"Procedure in Melting High Alloy Scrap," by Walter M. Patterson, Allegheny-Ludlum Steel Corp., Brackenridge, Pa.

"Improving Life of Furnace Linings, Roofs, and Ceramics," by Alex C. Texter, Atlas Steels, Ltd., Welland, Ont., Canada.

In the second ingot meeting, William L. Harbrecht, of Electro-Metallurgical Co., Niagara Falls, N. Y., led the panel and the papers presented were:

"Bottom Pouring Practice for Stainless Grades," by Jack H. Elsaman, Carnegie-Illinois Steel Corp., Chicago.

"Timing the Alloy Addition to Conserve Time and Deoxidization Practice in General," by Adolph J. Scheid, Jr., Columbia Tool Steel Co., Chicago Heights, Ill.

"Procedure in Melting the Low Alloy SAE and NE Grades," by Adam J. Texter, Universal-Cyclops Steel Co., Bridgeville, Pa.

"The Manufacture and Application of Steel for Canada's War Effort," by George H. McCally, Burlington Steel Co., Hamilton, Ont., Canada.

The casting section of the meetings were led in both sessions by Martin T. McDonough, National Malleable & Steel Casting Co., Sharon, Pa. Papers presented at these meetings were:

"Melting, Heat Treatment and Application of Low Alloy Steel Castings," by F. O. Lemmon, Ohio Steel Foundry Co., Springfield, Ohio.

"Transformers and Reactors," by James C. Sweitzer, Sivy Steel Casting Co., Milwaukee.

"Slag Control," by John W. Juppenlatz, Lebanon Steel Foundry Co., Lebanon, Pa.

"Basic Melting Practice," by George P. Messenger, Kensington Steel Co., Chicago.

An open forum meeting, held on Saturday, covered melting problems in electric steelmaking and the manufacture of gun tubes. Col. Steven Conner of Watervliet Arsenal, told how American made guns are meeting the test of use on every battlefield in the war. Col. Conner stated that in spite of the fabulous production of guns in America today, there has not been a single American built gun failure in the field since the beginning of the war. He recalled that toward the end of the last war, German guns were failing at the rate of one every 40,000 rounds of ammunition fired

## WESTINGHOUSE A-C WELDERS for use with the **UNIONMELT\*** PROCESS



# 5 REASONS



### WHY THE MAJORITY OF UNIONMELT USERS PREFER Westinghouse A-C Welders

- 1 Westinghouse transformer equipment is specially designed for use with the Unionmelt welding head.
- 2 Control and transformer are combined in the compact 1000-ampere welder.
- 3 Built-in power-factor correction reduces power demands.
- 4 Single pre-set current control speeds adjustment—simplifies operation.
- 5 Natural air cooling eliminates fans.

The Unionmelt Welding Process is the fastest known method of making butt, fillet, and plug welds—up to 20 times faster than any other method. Working together, Unionmelt equipment and Westinghouse A-C Welders form a team that will give you faster continuous production at a new low cost. Write for full details—ask for Booklet B-3090. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pennsylvania. J-90470

\* Unionmelt is the registered trade-mark of The Linde Air Products Co.

# Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE



"Absence makes the heart grow fonder—  
but not ABSENTEEISM!"

## Labor Worried by Program Changes

### Toronto

• • • Canada's revised war production program which involves a change-over from defensive to offensive fighting equipment on a broad scale is causing considerable worry to union heads and workers in general. While government officials state there will be no unemployment as a result of the changes, Selective Service is go-

ing ahead taking men out of what it calls unessential employment to place them in jobs for which the majority are definitely unfitted. Many thousands of workers will be called upon to give up their jobs in war plants making what is now termed obsolete equipment, and turn their hand to the new offensive weapons. No definite announcement has been made as to

when and how many workers will be moved, nor what locality they will be transported to. The only definite action so far is that lay-offs have begun, but in the Toronto area workers are quickly being absorbed into other branches of war production.

At present, the greatest problem appears to be the supply of farm labor. To obtain workers in this category, heavy withdrawals of labor have been reported from the essential base metal mines, which in turn are faced with serious labor shortages. About half the crew at the new Dominion Magnesium plant at Haley's Station, have been taken off their jobs and returned to the farms. Copper, zinc and other strategic mines also have been forced under Selective Service decree to relinquish workers to the farms.

### Kentucky Tool Plant Uses Women Toolmakers Successfully

Lexington, Ky.

• • • Archer & Smith, Ltd. (formerly Hub Tool Co.), pioneers in an intensive application of the policy of employing women for the production of precision cutting tools, report that they are more than satisfied with this type of specially trained toolmaker. When Frank Archer and G. R. Smith, both executives of the Wesson Co., Detroit, established this partnership at Lexington, they brought down key men from their Detroit plant to organize training courses to assure the specialized skill required in producing cutting tools for the aircraft industry. The women were given intensive training at the plant under actual production conditions and were graduated to precision tool work only as they attained the required proficiency.

Archer and Smith were months ahead of industry generally in adopting this policy at Lexington, a city selected because of the availability of this type of labor. These men conceived the idea after watching women at work in various local plants and seeing their hand and finger dexterity in operating intricate machines in the textile industry.

Aided by modern equipment which reduces physical effort by the operator to a minimum and permits closest control of all precision operations, these trained women toolmakers at Archer & Smith, Ltd., have proved highly successful. High precision standards have been consistently maintained.



{ Two Houghto - Black tanks in foreground. Houghto-Clean tank at extreme left. }

### Some Parts Now Being Blackened

Bicycle parts  
Bottle caps  
Carbine parts  
Dies  
Drills and bits  
Gun mount parts  
Hinges  
Machine gun clips  
Nuts and bolts  
Propeller parts, steel  
Radio parts  
Spark plug bodies  
Stirrup pumps  
Tools  
Typewriter pumps  
Washers

## A PROVEN SUCCESS FOR PRODUCTION LINE BLACKENING

The HOUGHTO-BLACK process fills a definite need in the metal industry today. The fact that it does not change dimensional sizes, permits its use as a finish on moving metal parts where no changes in tolerances can be allowed. Duplication of shades of black in correctly controlled baths permits mass production of parts made at different times. Other advantages are the low cost and simplicity of this low-temperature oxidizing process plus its wide application to the rigid requirements of war materiel. It will pay you to investigate HOUGHTO-BLACK! Ask the Houghton Man or write for factual folder.

**E. F. HOUGHTON & CO.**  
PHILADELPHIA

Chicago - Detroit - San Francisco - Toronto



WRITE FOR THIS FOLDER.  
CONTAINS FACTUAL DATA EXPLAINING  
HOUGHTO-BLACK PROCESS



**NOW-**  
**Trucks**  
**Haul HOT**  
**Materials**  
**- AT 1500°F**



**Another Dempster Development  
 For Industrial Material Handling**



One of the most amazing features of the Dempster-Dumpster system of material handling to officials of industrial firms who have installed this equipment, is the utter simplicity with which it has been adapted to their problems.

Illustrated in this ad is another recent Dempster development, worked out through the cooperation of our engineers and those of the buyer. This one for handling HOT materials, on a truck, direct from furnaces, at temperatures of 1100 to 1500° F, in one of the nation's largest metallurgical war plants. These bucket-bodies have a capacity of over four cubic yards each. Dempster-Dumpster hoisting units are available for such service with capacities for lifting, hauling, and discharging automatically up to 7½ tons pay load.

The special bucket-bodies shown here are hung against the bottoms of furnaces. When one is filled with hot molten furnace material, it is detached from furnace, hoisted, hauled and dumped by the Dempster-Dumpster, then returned to position. This single Dempster-Dumpster truck unit is kept busy serving a number of bucket-bodies, in turn, as they are filled.

The Dempster-Dumpster is accomplishing inconceivable results in speeding up production; in making drastic cuts in the use of trucks, gas and tires, while conserving man power, in hundreds of large industrial plants in the U. S. and allied countries.

There's a Dempster-Dumpster built for every type of material handling job. Write for—"How the Dempster-Dumpster Works."



**DEMPSTER  
 DUMPSTER**  
TRADE MARK REG.

**Dempster Brothers, Inc., 863 Springdale, Knoxville, Tennessee**

## Briefly Told—

April Deliveries of  
Ordnance Material 6  
Per Cent Over March

• Procurement of ordnance materiel in April, measured in dollar volume of deliveries, was two and one-half times as much as for April, 1942, and showed a 6 per cent increase over the

preceding month of this year, the War Department announced. During April, the Ordnance Department, Army Service Forces, accepted delivery of major items of ordnance materiel valued

at \$1,112,206,000, compared to materiel valued at \$444,324,000 accepted for delivery in April, 1942.

• Ground has been broken for a \$4,500,000 plant facilities expansion of Bell Aircraft Corp., Niagara Falls, to meet increased production of P-39 Airacobras and to enable continuous operation of flight test and delivery activities. Financed by the DFC, the project includes four new buildings, a boiler plant and gun ranges.

• Mobile cafeterias having a capacity of 250 hot meals each are being installed in the Bell Aircraft Corp.'s Buffalo plant. Workers will eat out of regulation Navy-type mess trays. The cafeterias will roll through assembly aisles and a staggered 30-minute lunch hour schedule is expected to be installed.

• The Bethlehem Steel Co. was directed June 3 by the National War Labor Board to grant a 5½c. per hour differential for underground workers at its Cornwall, Pa., iron ore mines. This differential is retroactive to Oct. 22, 1942.

The Board's order also directed that the following wage increases be granted at both the Cornwall mine and the company's concentrator plant in Lebanon, Pa.: 4c. an hour for jackhammer operators, retroactive to Oct. 22, 1942; 4c. an hour for open pit blasters, and 2½c. an hour for truck drivers, retroactive to March 5, 1943.

• A post-war international policing body to enforce peace, using as a means the control of mineral resources to allow all nations industrial expansion while preventing rearmament for war, was advocated by Dr. Charles Kenneth Leith, head of the metals and minerals branch of the office of production research and development, WPB, speaking at the commencement of the Graduate School of Stevens Institute of Technology, June 3.

• Clay products plants, now running at only 35 per cent capacity due to the curtailment of building programs, can readily be converted to charcoal production and can thus lessen the present critical shortage of this essential war material, the WPB revealed last week.

• An estimated 40,000 men and women in industry have been trained in the fundamentals of proper design, grinding, brazing and application of carbide tools during the past five months through the use of silent slide training films according to reports from Carboly Co., Inc., Detroit.

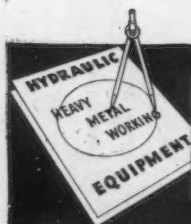
• The organization of the WPB Facilities Bureau has been completed with the following appointment of directors: F. J. C. Dresser, director, projects division; J. B. Campbell, director, production resources division; and W. E. Mullestein, director, production resources division.

• Iron & Steel Products, Inc., Chicago, is conducting a contest for symbol or illustration typifying the durability of service-tested iron or steel. They feel there must be something well known which has endured age or time, successfully, like the Sphinx, or "Rock of Ages," for example. It must be non-political and non-religious. A \$100 war bond is the prize.

For ship-  
yards, rail-  
road car  
shops and  
other fabri-  
cators of  
heavy metal.

## 400 TON HYDRAULIC FORMING &amp; FLANGING PRESS

A completely modern unit — fast, powerful and adaptable. Built to stand 24-hour production. Equipped with a unique type pump and valve design that eliminates the need for cooling coils with their inherent threat of water entering the oil supply line. If you fabricate heavy metal, investigate this and other of Beatty's complete line of punches, shears, coping machines, forcing presses, bulldozers, forming presses and related heavy machines.







# MAGNESIUM

## C A S T I N G S

The insistent demand for magnesium castings for armaments, especially aircraft, impelled us to start pouring at our new magnesium foundry long before the buildings were complete. Yet, with the importance of air control in mind, no effort on our part was too great.

Today, the output of this great foundry has expanded until it is the largest magnesium foundry in the world. Thin section magnesium castings of unprecedented size, one of which is illustrated, are being turned out as normal production. Complicated castings requiring as many as 100 cores and others equally unusual are daily production. Every week sees a greater tonnage of magnesium castings

for ships, ordnance, tanks, and essential war machines.

The lightness of magnesium, combined with its remarkable strength and machinability, is finding many uses in armaments.

At the two other Howard foundries, a growing volume of aluminum and bronze castings are being poured into the war effort. Three Howard foundries are dedicated to ever increasing their output to bring an early defeat to the Axis.

When you need nonferrous castings, call on Howard. For armament today—for utility tomorrow.

**Howard Foundry Company**  
4900 Bloomingdale Road Chicago



# HOWARD

ALUMINUM · BRASS · BRONZE · MAGNESIUM

## C A S T I N G S



• Buffalo Arms Corp. now is producing .50 caliber machine guns, according to a company announcement. Conversion of tooling on 1500 machines was accomplished without disrupting operations on other types of guns.

• Curtiss-Wright Corp. will allow employees up to six consecutive days off this summer. Those entitled to more than six days will be paid for the extra days in addition to regular pay. Last year all employees received extra pay instead of vacation time. The

company expects to maintain production schedules throughout the summer.

• Commenting on the government's recent announcement that an approximate \$4,000,000 worth of financed plant projects and machine tool contracts would be reviewed with the idea of cancelling considerable quantities of it, Joseph L. Trecker, vice-president of Kearney & Trecker Corp., Milwaukee, recently said that he believed his industry would continue to devote at least 50 per cent of its production to machine tools.

• A blast furnace at the Hanna Furnace Co., Buffalo, down for repairs since April 1, went back into production June 1.

• E. G. de Coriolis, research director, Surface Combustion Corp., Toledo, was given honorable mention by the National Metal Trades Association in recognition of his work in the development of the RX Gas Generator.

• A tabulation of earnings of 15 Wisconsin corporations in the metal trades field, shows only a slight gain in profits last year as compared with the previous year. Despite record sales as the result of war contracts there were no huge profits accrued. Noticeable is the fact that firms continuing to operate in their normal fields did not chalk up any large earnings.

• The skilled worker has less accidents when he has good physical coordination, Floyd R. Eastwood, professor of physical education, Purdue University, said to delegates at an Industrial Relations conference held recently at Milwaukee.

• The Compressed Air Institute estimates that the tonnage of air driven through blast furnace systems for the manufacture of pig iron will amount to more than 240,000,000 tons in 1943 and will be the third largest product of American industry.

• Investment in new industrial plants and equipment in the Chicago area during May totaled \$6,055,000, according to the Chicago Association of Commerce. This more than normal increment for May brings the total value of industrial expansion in the Chicago district since the start of the war production program to \$881,929,937.

• At Peoria, Ill., substantial production time was lost recently by plants which were forced to divert their employees to building levees and bulwarks against flood waters. The Keystone Steel and Caterpillar Tractor plants were able to resume operations on a limited scale in a few days. The R. G. LeTourneau plant operated on a reduced scale through most of the flood, and managed to send out several carloads of war goods.

• Japanese military expenditures for the fiscal year ending March 31, 1944, will exceed 80 per cent of total governmental expenditures or 64 per cent of the total national income of Japan, the Board of Economic Warfare announced recently. Total military expenditures are estimated at 32.2 billion yen, or about 9 billion dollars, compared to 21.8 billion yen, or about 6 billion dollars, for 1942-43.

• Development of a new test engine for pre-evaluating heavy-duty diesel lubricants has resulted in cutting test operating periods to 24 hr. from 480 hr., the diesel engine and fuels and lubricants meeting of the Society of Automotive Engineers was told recently. The new test engine is a single-cylinder Fairbanks-Morse diesel.

• In order to obtain the fullest possible use from existing farm machinery in the food production program, the Food Administration announced recently that measures are being provided to requisition idle farm machinery and to make it available for purchase by farmers who can put it to full use.

## America's finest complete service

to the Plating, Polishing  
and Anodizing Plants



Part of Udylite's design and layout department where you may obtain the advice and assistance of experienced metal finishing engineers.

This is the laboratory where all Udylite products are developed and constantly tested under actual plant operating conditions.

**UDYLITE has everything for the metal finishing plant. An Engineering Staff with years of practical experience to assist you in laying out your new plant or improving the efficiency of your present one.**

**Equipment for every need, that has proved its dependability in actual service records.**

**A very complete list of supplies second to none in quality. If you have a metal finishing requirement or a tough problem bring it to Udylite. Our experienced engineers and electrochemists are at your service. Your inquiry will be handled promptly and efficiently.**

## THE UDYLITE CORPORATION

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Long Island City, N. Y.  
11-16, 44th Drive

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4408 Carnegie Ave.



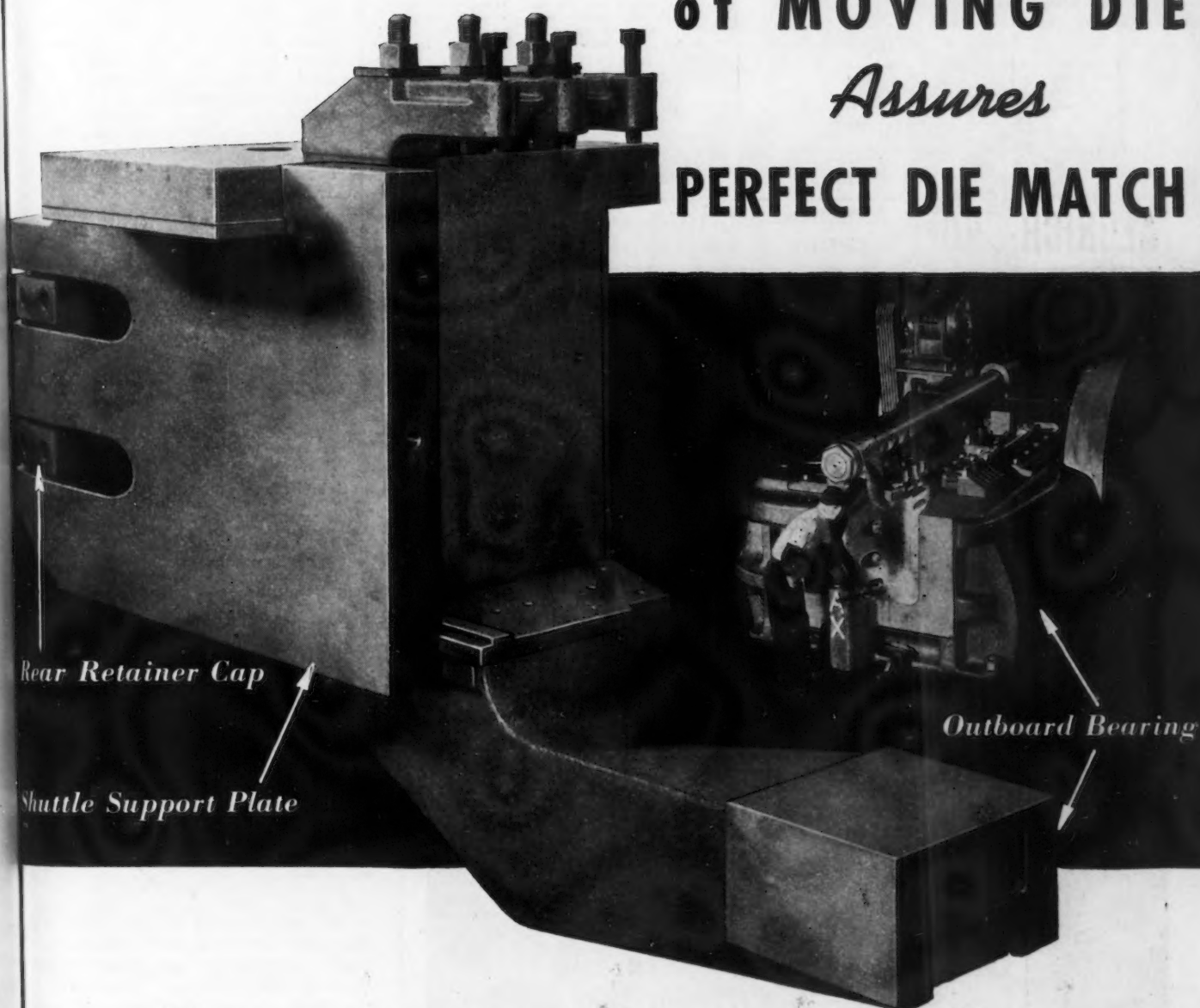
# AJAX SHUTTLE SUPPORT PLATE

*Prevents* **ROCKING**

**of MOVING DIE**

*Assures*

**PERFECT DIE MATCH**



**EXCLUSIVE** in Ajax Forging Machines, the shuttle support plate, with its independent retainer cap, rigidly supports the moving die against rocking under heading pressure, when in the closed position overhanging the feed gap.

The shuttle support plate permits opening-up the feed gap to take advantage of full die opening, affording the operator greater convenience in handling large forgings into and out of the gripper dies without sacrificing die alignment.

The shuttle support plate supplies the same degree of horizontal rigidity to the moving die as is afforded in the vertical plane, by the die slide outboard bearing, assuring perfect die match and uniform, close-tolerance forgings.

*Buy forging equipment on the basis of mechanical soundness*

HE **AJAX** MANUFACTURING COMPANY

EUCLID BRANCH P. O. CLEVELAND, OHIO  
621 MARQUETTE BUILDING • CHICAGO, ILLINOIS

• The No. 6 blast furnace at the Ensley plant of the Tennessee Coal, Iron & Railroad Co. was blown out May 30 for relining. It is expected to be back in production in about 30 days. Four days before it was blown out, the company's No. 5 blast furnace was blown in following complete relining.

• Upon appeal to the United States Circuit Court of Appeals at Richmond, Va., the Federal Trade Commission on May 21 dismissed a cease and desist order of Dec. 8, 1942, entered against the Wire Rope and Strand Manufacturers Association, Inc. The order had held the Association on all counts in the Commission's

complaint, including price fixing, classification of customers and circularization of distributor lists.

• A formal program of simplification of carbon brushes used in electric generators and motors was outlined at a meeting of the Carbon Brush Industry Advisory Committee with officials of the WPB and other government agencies in Washington. The program when completed will be of considerable help to the armed forces in combat areas in overcoming replacement difficulties due to the large number of sizes and types of brushes now in use.

• Following the directive from the War Labor Board in March for a 5½c. an hour increase, union maintenance for the duration, and a check-off provision, the Oliver Iron Mining Co., subsidiary of

## Locomotives in Use Decreased Since 1929

Cleveland

• • • There are in the United States today only about two-thirds of the number of locomotives on Class I railroads in 1929, Brig. Gen. Leonard P. Ayres, vice-president, Cleveland Trust Co., stated recently. In 1929 there were more than 57,000 locomotives, but the number has slowly reduced to about 39,000.

In 1943, the average number of locomotives stored and in reserve has decreased to about 700. Those awaiting repairs have been less than 200, or about 5 per cent of the 39,000 total. Those in actual use at present total about 38,000.

U. S. Steel, signed a foreman contract with the USWA-CIO on May 22, amplifying the formal agreement for all districts in which the company operates in the Lake Superior region. Slight differentials were eliminated, and the contract affects some 6000 production and maintenance workers.

• May shipbuilding hit a new high with 175 ships totaling 1,782,000 deadweight tons put into service. Total deliveries in 1943 are 711, approximately 7,142,122 tons, just 35 ships less than the 746 total for 1942. The May deliveries were in the following classes: 120 Liberty ships, 12 C-type cargo vessels, 12 coastal cargo boats, 12 commission tankers, 3 private tankers, 1 coastal tanker, 6 special type craft, 4 seagoing tugs, 1 concrete barge, and 4 ore carriers.

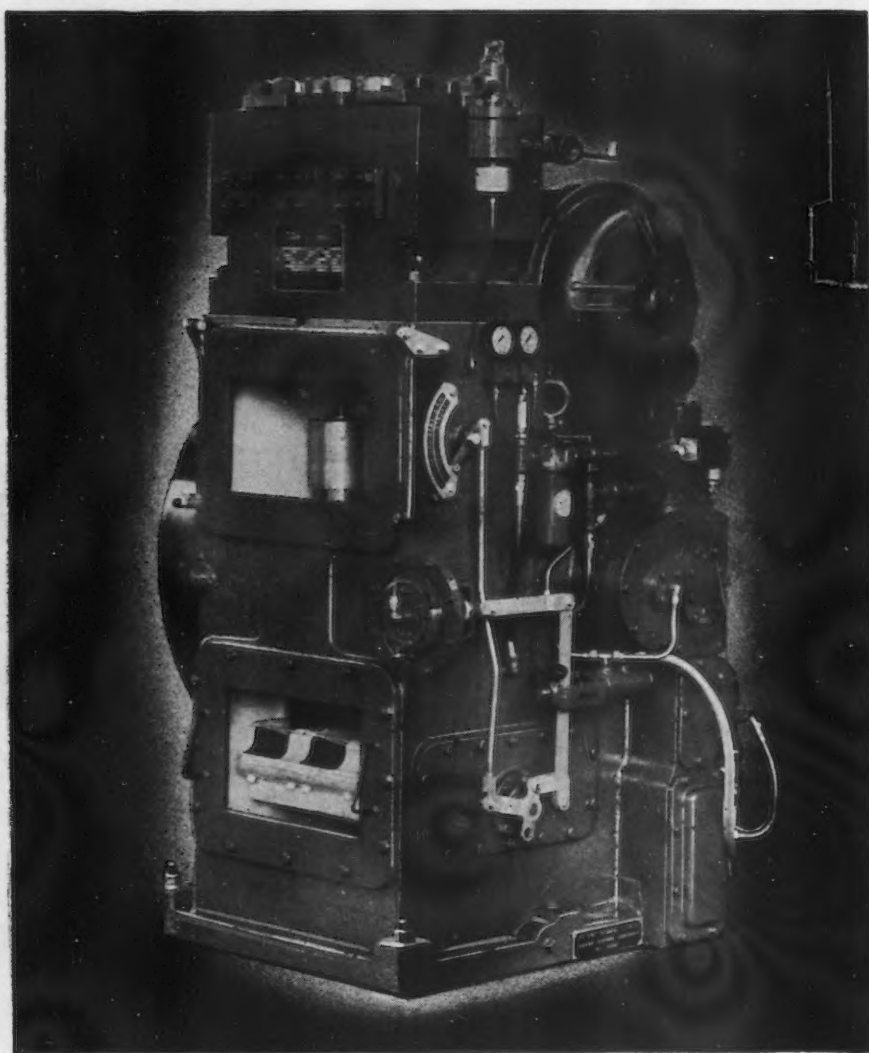
• To expedite the substitution of steel for brass in the production of military cartridges, a gift has been made to the United States Government of a patent covering the processing of ammunition parts made from "non-directional" steel, it was announced recently by John M. Olin, vice-president of Western Cartridge Co.

• Six months from the time steel was delivered for General Electric's mammoth new supercharger plant in Fort Wayne, Ind., shipment was made of the first carload of completed units for the U. S. Army. This was 60 days ahead of schedule and but 15 days after the first supercharger was produced.

• Ervin Brecklbaum has been elected president of the Milwaukee section of the American Welding Society. Other officers chosen were: vice-chairman, Carl Malmberg; secretary-treasurer, G. F. Meyer; and Herbert Pollei, Carl Schoenbaum, R. P. Walbridge and Chauncey Hart, new board members.

• A. G. Herreshoff, chief engineer of Research at Chrysler Corp., has been elected Detroit chairman of the Society of Automotive Engineers. Other officers are Secretary, R. J. Waterbury, Chevrolet; treasurer, F. W. Marschner, New Department Division, and the following vice-chairmen: Passenger cars, M. M. Roensch; Chrysler; body activity, F. W. Spring; Hudson; production activity, D. S. Harder; Fisher Body; aeronautic activity, D. R. Berlin, General Motors; junior-student activity, B. C. Erickson, Packard.

## ALDRICH-GROFF CONTROLLABLE CAPACITY "POWR-SAVR" PUMP



### ... FOR HYDRAULIC SERVICE

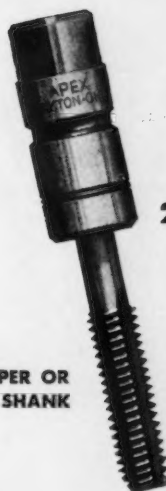
New standards of control simplicity, flexibility and operating economy are being set by these unique, constant-speed, variable-stroke vertical triplex pumps, which are designed to operate at discharge pressures as high as 15,000 p.s.i. Write today for Data Sheet 65 which gives full details of design, construction, operation and application.

**THE ALDRICH PUMP CO. ★ 8 PINE STREET ALLENTOWN, PENNA.**





1. MORSE TAPER OR  
STRAIGHT SHANK  
DRILLS



2. TAPPING



3. STUD SETTING



4. NUT SETTING

**4 Operations**  
with minimum  
changing time

It's no trick at all to change from one tool to another with APEX Quick Change Drill Chucks. Even green operators can do it—with one hand—without stopping or even slowing down the machine.

Apex Chucks are for use in drill presses, radials, multiple spindle machines, lathes, hand screw machines, tapping machines, electric and air tools. Shanks other than Morse Taper, can be furnished to suit machine spindle.

The collets are driven by hardened ball nosed plungers and are guaranteed not to fall out during the life of the chuck. Plungers are so designed that dirt cannot clog the hole and interfere with operation of the chuck.

Write for catalog 14.

# APEX

**THE APEX MACHINE & TOOL CO., DAYTON, OHIO**

Manufacturers of Safety Friction Tapping Chucks, Quick Change and Positive Drive Drill Chucks, Vertical Float Tapping Chucks, Parallel Floating Tool Holders, Power Bits for Phillips, Slotted Head and Clutch Head Screws, Hand Drivers for Phillips and Clutch Head Screws, Aircraft Universal Joints, Plain and Universal Joint Socket Wrenches.

## Preference Ratings Dropped For Steel Deliveries; Allotments Take Over

### Washington

• • • Elimination of the preference rating system for delivery of iron and steel products is the outstanding change made by WPB last week in its amendment to M-21, the basic order covering such products. The amendment was made in preparation for the

full operation, beginning July 1 of CMP. Until that date steel deliveries are permitted on a preference rating of A-10 or higher. Under the amended order, steel products may be delivered only on (1) authorized controlled material orders; (2) as permitted by Priorities Regulation No. 13; (3) by

CMP Regulation No. 4 (Sales of Controlled Materials by warehouse and distributors); (4) by orders M-21-b-1 and M-21-b-2 (distributors) or, (5) as specifically directed by WPB.

Steel forging and iron products alone are not included in steel products in CMP definitions. Steel forgings and iron products may still be delivered (1) on an A-10 or higher rating; (2) as permitted by Priorities Regulation No. 13; and (3) on orders authorized by WPB.

The amended M-21 order also makes it clear that second quality material and shearings of all types are subject to the same control as prime material. In this connection, Interpretation No. 1 of M-21 as amended points out that the terms "steel" and "iron products" do not include used material or steel which has been recovered or salvaged from used material. For example, shearings generated by a steel mill or croppings generated at a shipyard are covered by the order. If sold as scrap at OPA administration ceiling prices, however, such material may be disposed of free of the restrictions of the order. The restrictions also do not cover used material such as line pipe which has been in use by an oil company for a period of time, or structural steel salvaged from a demolished building.

The amended M-21 also changes the method of identifying purchase orders to terms of CMP claimant agencies from the former system of group classifications. Attention was called to the fact that while M-21 is the basic steel distribution order, additional rules covering steel distribution, as well as production and use, are incorporated in other WPB orders and regulations, particularly CMP regulations and other orders in the M-21 series. These must be complied with, except to the extent that their provisions are inconsistent with M-21.

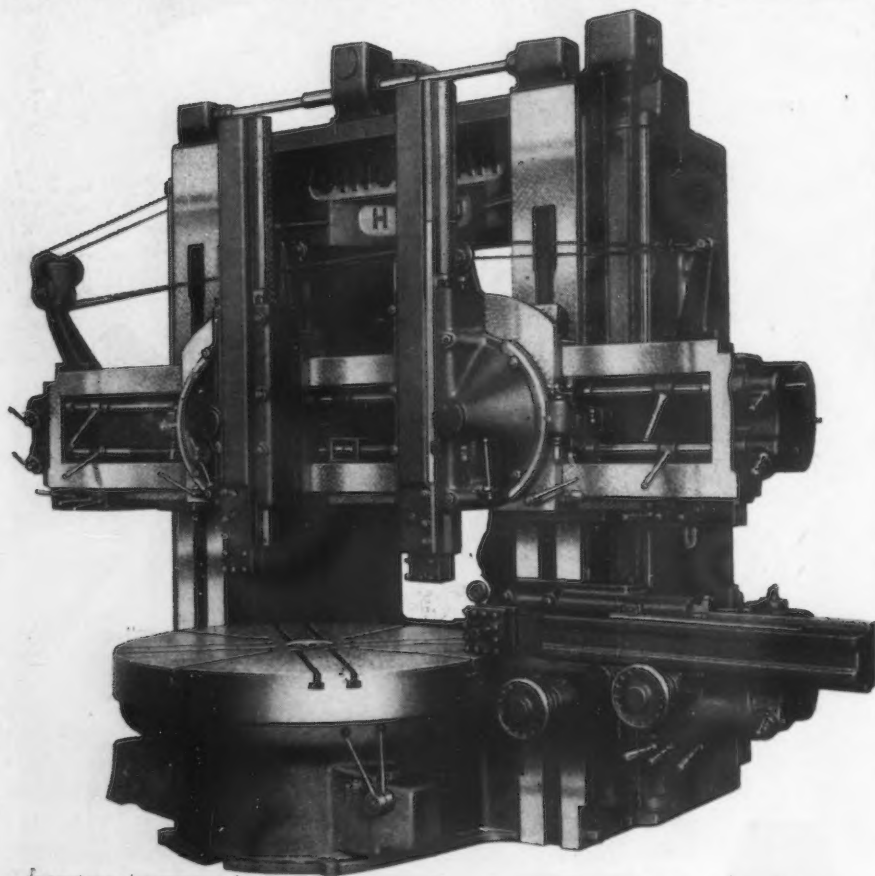
### Excess Sheet Stocks Ok'd For Certain Truck Body Uses

#### Washington

• • • Manufacturers may use sheet or strip steel in idle or excess inventories for the production of certain parts of automotive truck bodies under the terms of Order L-255 as amended last week by WPB. The order specifies that the metal must be either sheet or strip steel in the manufacturer's inventory on June 10, or reported as idle or excess inventory to WPB in care of the Steel Recovery Corp., Pittsburgh. The metal also may be sheet or strip mill rejects, seconds or wasters.

# Cincinnati

## HYPRO VERTICAL BORING MILL



• This 7' Hypro Boring Mill has individual feed, rapid traverse and reversing mechanism for each head including the side head. Ask for descriptive Bulletin 125 describing numerous exclusive Hypro-duction features.



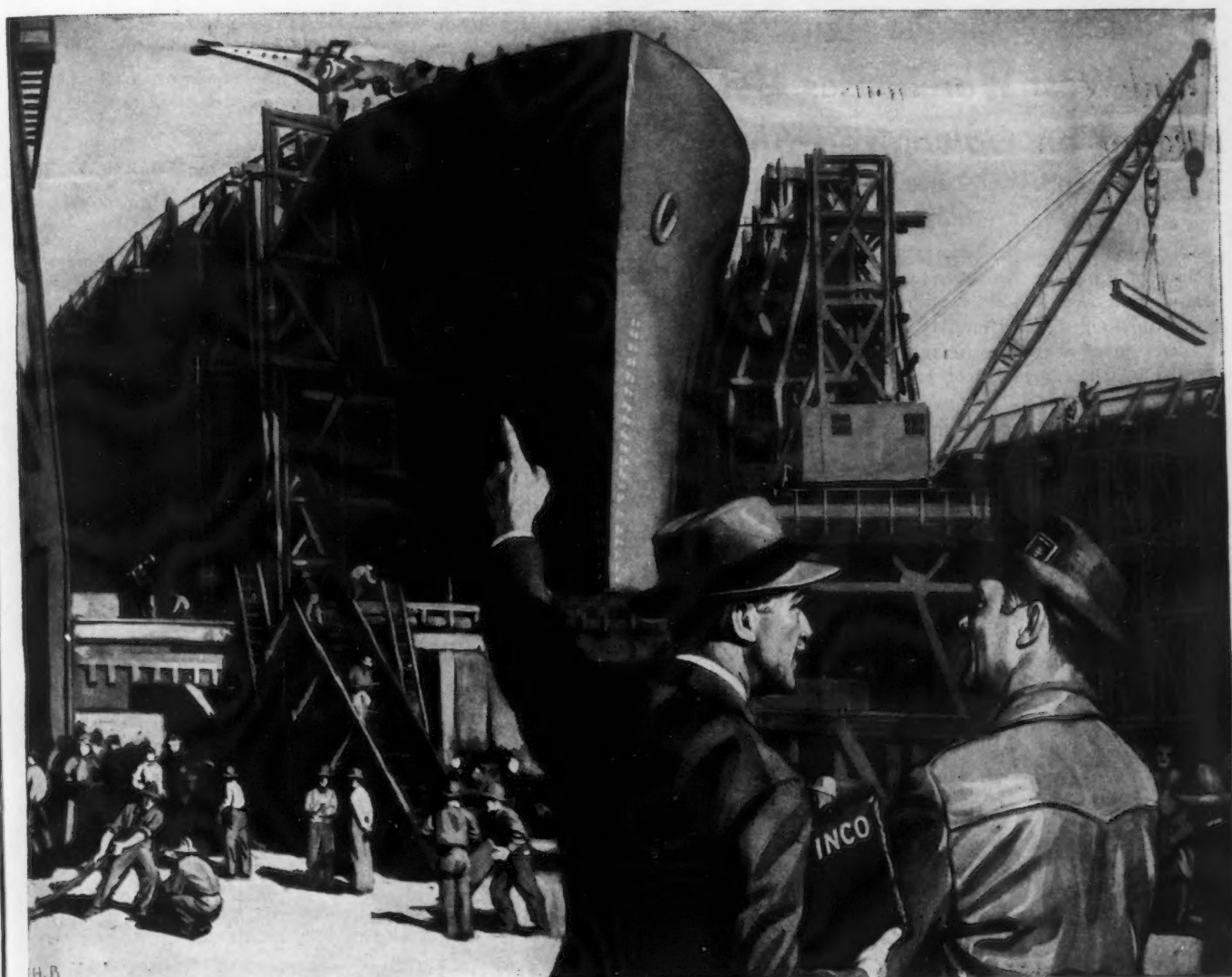
*The* CINCINNATI PLANER Co.

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OHIO, U. S. A.

PLANERS • PLANER MILLERS • VERTICAL BORING MILLS





## NICKEL AIDS THE MARINE INDUSTRY *to KEEP 'EM SAILING!*

"Uncle Needs His Ships." That sign in a shipyard, a thousand miles from the sea, typifies the fighting spirit of America's ship builders. These men will turn out new tonnage faster than Axis bombs and torpedoes can sink it.

In peacetime, their engineering-thinking created efficient power plants that pushed ships of commerce through the seven seas. They designed propelling machinery—turbines, valves, pumps and gears—to move the ship and intricate instruments to guide and guard it on its important mission.

From turbine rotors to propeller shafts, from reduction gears to condenser tubes, those engineers relied

upon ferrous and non-ferrous alloys strengthened and toughened by additions of Nickel. They used the properties of Nickel to fight corrosion and fatigue.

During wartime, when uninterrupted operation of America's bridge of ships means so much, the continued and widespread use of Nickel is convincing evidence of its many advantages. Now that sea-going metals must withstand repeated demands for stepped-up performance, a little Nickel goes a long way to insure utmost dependability.

Marine engineers and

designers have long known and builders and fitters...as well as repair crews at bases 'round the globe...are learning that, properly used, a little Nickel goes a long way to "keep 'em sailing."

For years the technical staffs of International Nickel have been privileged to cooperate with the men who build and operate ships of all types. Counsel, and printed data about the selection, fabrication and heat treatment of Nickel alloyed materials, is available upon request.



★ *Nickel* ★

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**THE INTERNATIONAL NICKEL COMPANY, INC., 67 Wall St., New York, N. Y.**

## Mid-West Warehouses Get Price Relief on Galvanized Sheet Seconds

### Washington

••• Upward revision of the prices of secondary and rejected classifications of galvanized sheets from warehouses in five Middle Western cities was announced last Thursday by OPA.

The price increases were necessitated by the allocation of galvanized

sheet production to non-integrated mills in the Eastern and Southern states. As a result of this allocation, integrated mills, with a Chicago basing point, no longer are manufacturing galvanized sheets, but are using their producing facilities to turn out other types of steels for war indus-

tries, and warehouses in the Mid-Western area must pay higher transportation costs for shipments from producing mills.

The price increases in the reject classifications are: Chicago, \$6.60 per net ton; Milwaukee, \$5.00; St. Paul, \$4.60; Detroit, \$2.60, and St. Louis, \$1.40. Increases for wasters, waste wasters, offal, side and end shearings and galvanized sheets sheared to specifications, have been adjusted.

The new prices are established in Amendment No. 15 to RPS No. 49, which becomes effective June 21. Similar adjustment upward in the prices of prime galvanized sheets is made through the operation of pricing provisions contained in Amendment No. 16 to the Schedule.

Amendment No. 15, besides adjusting prices of secondary galvanized sheets, makes two other changes. First, it makes provision for adjusting transportation charges when iron and steel products are delivered by truck outside the warehouseman's normal marketing area, and second, it simplifies the procedure for determining the quantity charge or deduction in the price of a secondary iron or steel product sold from a warehouse.

### New Valve Producers Exempt from Ceiling Prices

#### Washington

••• To facilitate the production of steel valves to be sold to government agencies for use in the war effort, the OPA last week exempted from price control steel valves, valve parts and subassemblies as well as any operation performed in the processing, machining, welding, treating or finishing of these products when sold or performed by new subcontractors to and for valve manufacturers under contract with the Navy Department for these articles.

To meet pressing needs for valves it has been found necessary to bring new producers and suppliers of machinery services into this field, and OPA action was taken to facilitate the program. The cost of these new producers and suppliers cannot be determined at this time, and price control exemption will enable the production and servicing to go forward without delay.

The exemption for new producers or service suppliers being brought into this field is contained in Amendment No. 12 to Revised Supplementary Regulation No. 1, and Amendment No. 23 to Revised Supplementary Regulation No. 11, of the General Maximum Price Regulation, effective June 7.




IN 1418 the manufacture of wire was crudely accomplished as shown in this old sketch. The resulting product was very unlike today's wire.

Centuries of progress in wire making have made possible the Torrington Spring Coiler. With modern wire, uniform in temper and diameter, the rapid production of accurately formed uniform springs on Torrington Coilers helps professional springmakers satisfy an ever more particular clientele. Rigid specifications may be adhered to with mass production when a Torrington Spring Coiler is used.

No. 1 of a Series

**THE TORRINGTON**  
MANUFACTURING COMPANY  
TORRINGTON, CONNECTICUT





## HOW TO SAVE CRITICAL ALLOYS *BY THE TON!*

How do you intend to fabricate that steel you've ordered? Your answer may conserve tons of critical alloys...save you trouble in the bargain. This recent Frasse case history will testify:

The contractor had just ordered 2½ tons of high sulphur, free-machining stainless bars. Frasse, following its usual practice, made a routine check on the end use. Working on subcontract, purchaser was unable to give details—added that machineability was his only concern.

Frasse insisted. Purchaser contacted his prime contractor...learned that the steel was used for aircraft cable terminals. Familiar with this application, Frasse knew the parts would be swedged—warned that high sulphur stainless would crack in the operation.

Instead, Frasse recommended selenium free-machining, rather than a high sulphur stainless. The suggestion was accepted—with this subsequent comment by the customer: "Frasse foresight and knowledge saved us from machining critical alloys which would have been a total loss."

Here is conservation by the ton. Why not keep your steel source fully informed on your fabricating operations? Combined with his steel "know how", your data will eliminate expensive rejects...conserve critical material...help America do the job. *Peter A. Frasse and Co., Inc., Grand Street at Sixth Avenue, New York, N. Y. (Walker 5-2200) • 3911 Wissahickon Avenue, Philadelphia, Pa. (Radcliff 7100-Park 5541) • 50 Exchange Street, Buffalo, N. Y. (Washington 2000) • Jersey City, New Jersey Hartford, Connecticut • Rochester, N. Y. • Syracuse, N. Y.*

# Frasse

### Mechanical and Aircraft STEELS

Seamless Mechanical and Aircraft Tubing • Aircraft Steels  
Cold Rolled Strip and Sheets • Welded Steel Tubing • Stainless  
Steels and Tubing • Drill Rod • Cold Finished Bars • Alloy Steels

## New WPB Form Numbers Confusing

### New York

• • • A new numbering system for the identification of WPB forms was announced last week as a "simplified" system even though the new numbers may completely obsolete every form-file in all industries, change all reporting schedules established by manufacturers and generally cause confusion in the ordering and handling of WPB

forms at a time when early confusion over the mass of required reports had about subsided.

A nation-wide change in the processing schedules and filing of forms seems inescapable as the new WPB numbers on the forms do not follow in any numerical sequence the former numbers. Industries that have grown familiar with all of the required report

and application form numbers governing them will now have to educate their personnel to an entirely new group of form identifications. This will also require alterations of all standardized instructions and reporting schedules to comply with the new system. Even regional WPB offices, which were not informed on the matter previously, are complaining about the inconvenience the changes will cause in their own files and stock rooms.

The only purpose that the change can accomplish, according to WPB's own explanation, is that the "control" numbers which have always appeared on the forms for internal records of WPB and the Printing Office will now become the official designation of the forms. That this accomplishment may create more inconvenience in war industries than it will aid WPB seems to have been overlooked.

While the new system is destined to eventually cover the entire scope of WPB printed matter the new numbers have been applied to only about 600 forms. Four months, dating from June 7, will be allowed for the trade to become accustomed to the new identifications, after which time the old identification numbers will no longer appear on the forms. Present forms with only the former numbering system will be valid until about Oct. 7.

Following is a conversion table for the 600 forms which have been re-numbered up to June 7:

Present Number	WPB Number	Present Number	WPB Number
PD-1 A	541	PD-62	410
PD-1 A Suppl.	1524	PD-66 A	95
PD-1 X	547	PD-69	900
PD-3 A	542	PD-70	901
PD-4 X	2034	PD-71 B	1640
PD-4 X-1	1739	PD-71 C	1648
PD-4 Y	2029	PD-71	902
PD-4 Z	2167	PD-71 D	2885
PD-9 C	2868	PD-72	1242
PD-9 D	2869	PD-76	2886
PD-9 E	2870	PD-76 C	2887
PD-26 M	309	PD-76 D	1279
PD-27	2871	PD-83	2888
PD-27 A	2872	PD-83 E	2889
PD-27 B	2873	PD-83 F	2890
PD-29	1020	PD-83 G	2891
PD-30	1786	PD-83 I	2892
PD-31	1302	PD-94 A Sched. I.	2893
PD-32	247	PD-94 A Sched. II.	2894
PD-33	2874	PD-94 A Sched. III.	2895
PD-33 A	2875	PD-96	1747
PD-36	2876	PD-99	180
PD-36 A	2877	PD-99 A	971
PD-40 A Aircraft	701	PD-99 B	970
PD-40 M	702	PD-102	151
PD-49	76	PD-103	762
PD-53 B	689	PD-104	761
PD-54	225	PD-105	2896
PD-59	2953	PD-105 A	2897
PD-59 A	2954	PD-107	167
PD-59 B	2955	PD-110	166
PD-59 D	2956	PD-112	760
PD-59 E	2957	PD-112 A	1104
PD-59 F	2958	PD-113	722
PD-59 G	2959	PD-114	165



# VULCAN

## Means POSITIVE

## Cycling . . . and

## CONSISTENT

## Uniformity . . .

## for Faster War Production!

## 100-TON DIRECT FIRED VULCAN FURNACE, FOR STRESS RELIEF, ANNEALING, NORMALIZING

Used in the production of castings for naval construction, the large VULCAN Furnace illustrated is equipped with full program temperature control by which the rates of heating, holding and cooling can be predetermined. Automatic furnace pressure control assures consistent temperature uniformity on the work and good surface conditions. Although direct fired, a convection effect can be secured automatically, with forced cooling under program control. Car and door are motorized, with push-button control stationed at front of furnace. Oil or gas fired.



Consult VULCAN engineers regarding your heat treating or heating requirements, and get their recommendations based on many successful installations.

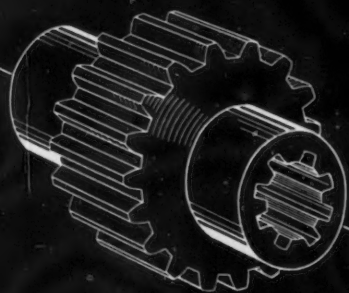
# VULCAN CORPORATION

NORTH 18<sup>TH</sup> & CHERRY STS., PHILADELPHIA, PA.



## RECOMMENDED PROCEDURE

1. MACHINE END FACE
2. DRILL HOLE
3. BROACH HOLE
4. FINISH END FACE  
AND CONTOUR  
LOCATING FROM  
BROACHED HOLE



## COMMON PROCEDURE

1. MACHINE END FACE
2. DRILL HOLE
3. MACHINE CONTOUR  
LOCATING FROM  
DRILLED HOLE
4. BROACH HOLE

*How to get more accuracy  
by Broaching* -----

## 5. BY PROPER MACHINING SEQUENCE.

THE drawing used at the left illustrates a broaching principle.

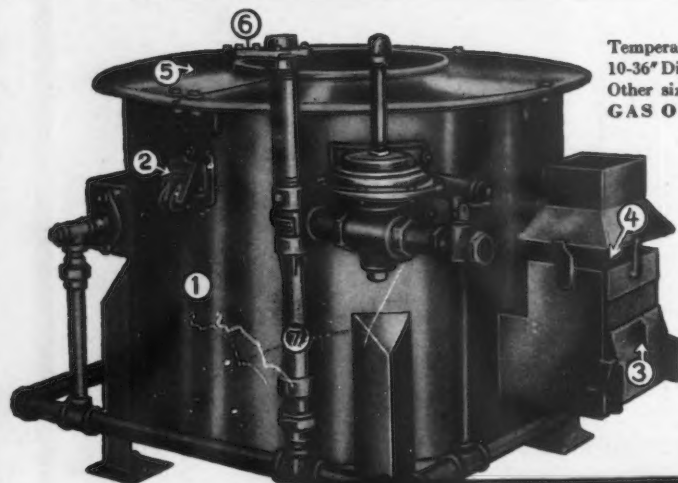
To get the most out of broaching—don't expect a broach to correct eccentricities or lack of squareness created by previous machining sequence. Broach your holes and surfaces FIRST and then use these surfaces to locate from.

This is one of the "Do's and Don't's on Broaching" available in printed form in bulletin board size. Write for a copy today. Ask for Bulletin No. 274.

**colonial** BROACH COMPANY  
*Broaching Machines*  *Broaches-Broaching Equipment*  
DETROIT..... U. S. A.

Present Number	WPB Number	Present Number	WPB Number	Present Number	WPB Number	Present Number	WPB Number	Present Number	WPB Number	Present Number	WPB Number
PD-123	2898	PD-159 E	456	PD-209 B	2913	PD-236	465	PD-290	697	PD-435	1018
PD-123 C	2899	PD-169	652	PD-213	412	PD-237	1148	PD-291	698	PD-436	1019
PD-123 D	2900	PD-169 A	653	PD-215	460	PD-240	202	PD-292	699	PD-440	946
PD-124	1713	PD-174	336	PD-217	431	PD-251	2916	PD-293	2921	PD-441	945
PD-127	1068	PD-188	2906	PD-222 A	1039	PD-252	2917	PD-293 A	2922	PD-442	983
PD-128	2901	PD-188 C	2907	PD-222 B	1040	PD-253	2918	PD-294	2923	PD-443	2032
PD-129	2902	PD-190	2908	PD-222 C	1041	PD-254	2919	PD-294 A	2924	PD-447	938
PD-138	929	PD-191	627	PD-223	438	PD-254 A	2920	PD-295	604	PD-450	1010
PD-139	928	PD-192	427	PD-223 A	1173	PD-262	503	PD-298	2925	PD-451	1011
PD-148	1990	PD-200	617	PD-224	439	PD-263	501	PD-299	2926	PD-452	1012
PD-149	2903	PD-200 B	1548	PD-226	2914	PD-272	554	PD-300	646	PD-453	1013
PD-150	2904	PD-200 C	2570	PD-226 B	2915	PD-274	568	PD-303 A	624	PD-456	891
PD-151	2905	PD-205	372	PD-228	1907	PD-283	620	PD-303 B	623	PD-457	892
PD-156 A	1450	PD-209 A	2912	PD-235	482	PD-285	576	PD-304	622	PD-458	890
								PD-307	616	PD-464	1017
								PD-308	838	PD-466	829
								PD-310	663	PD-469 Part 1	9141
								PD-311	2927	PD-469 Part 2	9142
								PD-311 C	2928	PD-470	1161
								PD-312	599	PD-474	865
								PD-314	1714	PD-475	1001
								PD-315	671	PD-476	1069
								PD-316	642	PD-480	1085
								PD-319	651	PD-481	1038
								PD-321	717	PD-483	1076
								PD-322	718	PD-484	1033
								PD-325	1276	PD-487	1097
								PD-326	2929	PD-488	1102
								PD-326 A	2930	PD-489	1098
								PD-329	678	PD-494	1103
								PD-333 White	1436	PD-495	1037
								PD-333 Blue	1436	PD-496	1122
								PD-334	951	PD-497	1123
								PD-336	825	PD-499	1066
								PD-338	675	PD-500	1477
								PD-339	834	PD-500 B	2242
								PD-344	759	PD-501	977
								PD-351	707	PD-502	978
								PD-356	660	PD-504	1147
								PD-359	763	PD-512	1110 A
								PD-360	765	PD-513	1110 B
								PD-373	1437	PD-514	1110 C
								PD-376	749	PD-516	1157
								PD-377	751	PD-519	1182
								PD-378	750	PD-520	1158
								PD-380	2931	PD-530	1005
								PD-381	2932	PD-530 A	1005
								PD-385	1262	PD-531	1117
								PD-387	813	PD-532	1200
								PD-389	805	PD-537	1132
								PD-391	2933	PD-542	1212
								PD-391 A	861	PD-543	1305
								PD-394	939	PD-543 A	1306
								PD-395	831	PD-545	1290
								PD-397	809	PD-545 A	1784
								PD-399	863	PD-545 B	2154
								PD-400 A	2937	PD-549	1239
								PD-400 B	2938	PD-550	1238
								PD-400 C	2939	PD-552	1277
								PD-404	841	PD-553	1280
								PD-405	803	PD-556	1319
								PD-408	837	PD-556.21	1319.01
								PD-410	874	PD-559	1228
								PD-411	1236	PD-560	1229
								PD-412 A	1180	PD-562	1237
								PD-413	824	PD-566	1263
								PD-414	748	PD-567	1293
								PD-415	931	PD-568	2026
								PD-416	975	PD-569	1325
								PD-418	924	PD-569 A	1322
								PD-419	923	PD-569 B	1323
								PD-419 Sec. D	923	PD-569 C	1321
								PD-419 Sec. E	923	PD-569 D	1324
								PD-419 Sec. F	923	PD-571	2941
								PD-420	930	PD-572	2942
								PD-421	894	PD-574	1344
								PD-424	967	PD-575	1335
								PD-425 A	1034	PD-578	1379
								PD-425 B	1035	PD-581	2943
								PD-426	940	PD-582	2944
								PD-427	882	PD-583	1346
								PD-428	867	PD-584	1345
								PD-429	868	PD-585	1359
								PD-430	869	PD-586	1366
								PD-431	713	PD-589	1295

## 20 STANDARDIZED SIZES for PROMPT DELIVERY



Temperatures up to 1800°  
10-36" Dia. . . . 14-80" deep.  
Other sizes built to order.  
GAS OR OIL-FIRED

## DEMPSEY 9" WALL POT FURNACES

### 7 Features OF SUPERIORITY

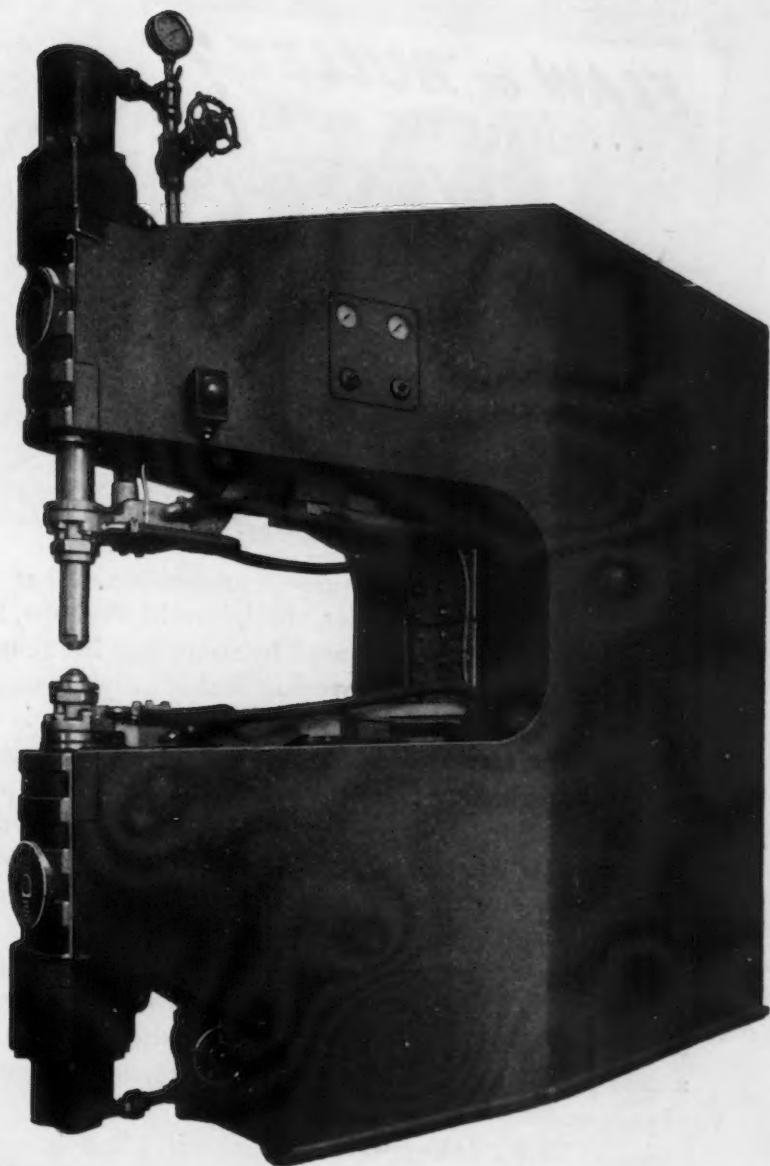
1. Steel shell continuously welded
2. Convenient lighting and observation port
3. Accessible flue clean-out
4. Ventilated stack connection . . . keeps all heat inside furnace
5. All cast-iron top plate arranged to prevent salt seepage
6. Single valve operation
7. Automatic air-gas proportioning

Ruggedly built in a wide range of sizes and for operations varying all the way from drawing to hardening . . . every DEMPSEY Pot Furnace offers the additional advantage of a heavily insulated 9" wall for longer life and greater fuel economy. Liberal combustion space, too, with burners properly applied to give long pot life. Standardized oil and gas-fired models completely designed and available for prompt shipment ; . . all assembled ready for air and fuel connection.

**DEMPSEY INDUSTRIAL FURNACE CORPORATION**  
Combined 50 years' experience building Dempsey and Gilbert & Barker Furnaces for all heat treating needs  
SPRINGFIELD • MASSACHUSETTS



FOR SHIP-BUILDING—The "Temp-A-Trol" welder (right) has a maximum throat depth of 44 inches. It will handle the heat-treated welding of plates far beyond the thickness ordinarily considered practical for spot-welding.



# *The Newest thing in Welding* **"TEMP-A-TROL"**

- Combines resistance welding and heat-treating of welds
- Automatic thermo-couple control of weld-cycle
- Ideal for heavy sections and alloy steels

Send for Bulletin No. 301 on your company letterhead for complete information

## **PROGRESSIVE WELDER CO.**

SEAM PROJECTION & BUTT . . . Electric Welding Equipment . . . PORTABLE GUN & PEDESTAL

3050 E. OUTER DRIVE • DETROIT, U. S. A.



The self-compensating "Temp-A-Trol" will weld a series of different sections like this without changing the machine setting.



ONE of our tanks is out of commission. What did it . . . an enemy bullet, shell, bomb? Perhaps. But it also could have been caused by some flaw in the construction . . . a structural weakness that only the test of battle brought to light. In either case, the result is the same . . . our tank is disabled, useless and out of action.

Flaws that may result in material failures often pass inspection because they are not detected by surface examination. However, inspection by X-ray removes this guesswork and reveals defects in the "inside" structure.

In many leading war plants KELEKET X-ray units are on the job detecting hidden flaws in critical materials ranging from thin aluminum sheets to heavy armor-plate . . . assuring our fighting men safer tanks, planes and ships.

A KELEKET Industrial Engineer will gladly consult with you and discuss the practical applications of X-ray inspection for your plant. There is no obligation.



**KELLEY-KOETT X-RAY MFG. COMPANY**

2306 WEST FOURTH ST., COVINGTON, KY

**PIONEER CREATORS OF QUALITY X-RAY EQUIPMENT SINCE 1900**

**FOR LIGHT ALLOYS AND DIE CASTINGS . . . . KELEKET**

**PROVIDES BETTER THAN 5% FLUOROSCOPIC SENSITIVITY**



Producers of light alloy castings will be interested in KELEKET'S Fluoroscopic equipment. Except in the few cases requiring film records this apparatus meets all requirements for X-ray inspection. The savings resulting from the elimination of film and processing costs are substantial.

Present Number	WPB Number	Present Number	WPB Number
PD-592	1402	PD-712	1732
PD-593	1357	PD-713	1962
PD-595	1447	PD-716	2001
PD-597	2071	PD-717	1887
PD-598 A	1303	PD-718	1937
PD-598 B	1304	PD-722	1843
PD-598 C	2209	PD-723	1867
PD-599	1334	PD-725	1751
PD-600	2945	PD-727	2148
PD-601	2946	PD-728	1906
PD-602	2947	PD-729	1905
PD-603	1940	PD-731	1915
PD-604	1442	PD-733	1839
PD-605	1443	PD-734	1837
PD-612	1385	PD-735	1838
PD-614	1383	PD-738	1801
PD-615	1475	PD-739	1964
PD-615 B	1474	PD-740	1808
PD-616	2948	PD-741	1953
PD-616 B	2949	PD-742	1820
PD-616 C	2950	PD-743	1995
PD-617	1861	PD-744	1823
PD-618	1444	PD-745	1806
PD-619	1446	PD-746	1805
PD-620	1414	PD-747	2002
PD-625 A	1507 A	PD-748	1888
PD-625 B	1507 B	PD-749	1889
PD-625 C	1507 C	PD-750	2006
PD-625 D	1507 D	PD-751	1824
PD-625 E	1507 E	PD-752	2022
PD-625 F	1507 F	PD-754	1902
PD-628	1545	PD-755	2020
PD-629 A	1769	PD-756	2077
	Supp. I	PD-758	2021
PD-630	1768	PD-759	2069
PD-637 A	2226	PD-760	2040
PD-637 B	1835	PD-761	2117
PD-638	1509	PD-762	1765
PD-638 A	1529	PD-763	2165
PD-639	1510	PD-764	2164
PD-641	1565	PD-765	2163
PD-644	1615	PD-767	2179
PD-645	1619	PD-768	2146
PD-651	1609	PD-769	2176
PD-653	1606	PD-770	2211
PD-654	1627	PD-772	2177
PD-655	1600	PD-774	2232
PD-656	1625	PD-776	2278
PD-658	1628	PD-778	2256
PD-661	1639	PD-779	2137
PD-662	1490	PD-781	2287
PD-665	1790	PD-782	2188
PD-667	1646	PD-786	2289
PD-668	1612	PD-787	2290
PD-669	1313	PD-788	2413
PD-670	1313 A	PD-789	2272
PD-671	1313 B	PD-790	2273
PD-672	1709	PD-791	2322
PD-673	1707	PD-791 A	2322
PD-674	1682	Supp. I	2317
PD-675	1687	PD-792	2341
PD-676	1685	PD-793	2330
PD-677	1706	PD-794	2312
PD-678	1680	PD-797	2395
PD-679	1679	PD-799	2408
PD-680	1655	PD-802	2401
PD-681	1593	PD-803	2407
PD-685	1703	PD-804	2362
PD-686	1688	PD-805	2420
PD-688	1620	PD-806	2421
PD-689	1621	PD-810	2446
PD-690	1622	PD-811	2145
PD-691	1724	PD-812	2951
PD-693	906	PD-813	2952
PD-695	1689	PD-814	2472
PD-697	1804	PD-815	2406
PD-698	1172	PD-816	2424
PD-699	1722	PD-817	2935
PD-700	1767	PD-819	2491
PD-701	1781	PD-820	2492
PD-703	1791	PD-821	2493
PD-704	1778	PD-822	2477
PD-705	1787	PD-823	2462
PD-706	1770	PD-824	2452
PD-707	2060	PD-825	2459
PD-708	1813	PD-826	2433
PD-709	1673	PD-827	2474
PD-711			



Here at last . . . the answer to Corrosion Problems

# ANTI-CORRODE

New Liquid Safeguard Developed by Cities Service

**Anti-Corrode, Proved Perfect by Months of Laboratory Testing, Meets Severest Corrosion Requirements. It's Easy, Economical to Apply.**

After months of laboratory research and rigorous service tests, Cities Service takes pride in announcing the development of a new and completely effective corrosion preventive—Anti-Corrode.

This new liquid safeguard, by virtue of its special properties, and its reasonable cost, is hailed by many engineers as a perfect answer to the vital problem of metal conservation that American industry faces today.

## METHODS OF APPLICATION

Anti-Corrode can be applied to raw stocks, finished parts, or to complete machines during storage, assembling or shipping. It is easily applied by dipping, brushing, rubbing, hand or power spraying—and provides a safe film which does not harden, become brittle or crack.

## WEATHERING

Anti-Corrode is not affected by rain, salt air, oxygen bearing moisture, etc.

## ODOR

Anti-Corrode has no disagreeable odor.

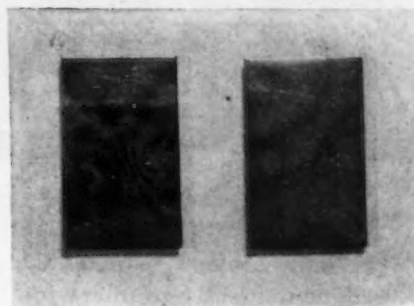
## CHEMICALLY INERT

Anti-Corrode is chemically inert to ferrous or non-ferrous metals. Therefore, it can cause no injury to any metal to which it is applied or with which it may be brought in contact.

## FINGER STAINS

Surfaces coated with Anti-Corrode can be handled freely without danger of rust spots caused by hand acid.

## ANTI-CORRODE MEETS U. S. NAVY TEST



*BOTH STRIPS of freshly ground steel pictured here were immersed for 20 hours in a 3% salt solution. Strip on left was untreated; strip on right, coated with Anti-Corrode, shows no trace of rust. (Even after 90 hours of immersion Anti-Corrode coating still resisted rust.)*

## A LUBRICANT, TOO

Anti-Corrode is compatible with drawing compounds; there is no need to remove it from

metal about to be drawn, stamped or otherwise formed.

## IDEAL FOR MANY USES

Anti-Corrode can be used on almost every kind of metal or metal equipment—indoors or outdoors. Fencing, piping, tubing, wire, wire mesh, girders, sheet metal, metal stock, machinery, trucks, spare automotive parts, tools, metal containers—all need the protection of this new corrosion preventive.

## ECONOMICAL

In accordance with regular U. S. Navy Test procedure, Anti-Corrode proved far superior to other leading anti-rust compounds costing as much as 25% to 40% more per gallon.

Whatever metal equipment you may have, you owe it to yourself to investigate the money-saving advantages of Cities Service Anti-Corrode. (One gallon of Anti-Corrode protects approximately 1200 square feet of sheet metal.) Send the coupon below for further information on how to obtain an adequate sample of Anti-Corrode FREE.

**CITIES SERVICE OIL COMPANY**  
Room 1639,  
Sixty Wall Tower, New York.

Gentlemen: I'd like to test Anti-Corrode on my own equipment FREE OF CHARGE. Send me the details.

Name.....

Title.....

Company.....

Address.....

OIL IS AMMUNITION—USE IT WISELY!

**CITIES SERVICE OIL COMPANY**

NEW YORK • CHICAGO

IN THE SOUTH

**ARKANSAS FUEL OIL COMPANY**

SHREVEPORT, LA.

Present Number	WPB Number	Present Number	WPB Number	Present Number	WPB Number	Present Number	WPB Number
PD-828	2499	PD-863	2604	PD-900.09	3000.09	UF-5	1127
PD-829	2277	PD-864	2665	PD-900.10	3000.10	UF-6	2567
PD-830	2449	PD-865	2531	PD-900.11	3000.11	UF-11	2519
PD-831	2448	PD-866	2532	PD-900.12	3000.12	UF-12	1131
PD-833	2524	PD-867	2683	PD-900.14	3000.14	UF-13	327
PD-834	2507	PD-868	2679	PD-900.15	3000.15	UF-14	198
PD-835	2461	PD-869	2680	PD-900.20	3000.20	UF-15	331
PD-836	2562	PD-870	2613	PD-900.30	3000.30	UF-17	2656
PD-838	2510	PD-871	2650	PD-901	3001	UF-18	2652
PD-839	2545	PD-872	2720	PD-901.10	3001.10	UF-19	2653
PD-840	2521	PD-873	2565	PD-901.13	3001.13	UF-20	2655
PD-841	1262	PD-874	2526	PD-901.20	3001.20	UF-21	2654
	Supp. I	PD-876	2191 A	PD-901.21	3001.21	UF-22	2641
PD-842	698	PD-877	2936	PD-902	3002	UF-23	2643
	Supp. I	PD-878	2736	PD-902.16	3002.16	UF-24	2642
PD-843	2578	PD-879	2754	PD-902.17	3002.17	UF-25	2645
PD-844	2585	PD-881	2700	PD-902.18	3002.18	UF-26	2710
PD-845	2494	PD-882	2734	PD-902.19	3002.19	UF-27	2330
PD-846	2582	PD-883 Supp. I	2429	PD-902.21	3002.21	UF-29	1132
PD-847	2661		Supp. I	PD-902.22	3002.22	UF-31	2717
PD-848	2583	PD-884	2791	PD-902.23	3002.23	CMP-7	2254
PD-849	2406	PD-885	2782	PD-902.24	3002.24	CMP-8	2633
	Supp. I	PD-886	2781	PD-902.25	3002.25	CMP-11	2444
PD-850	2591	PD-887	2780	PD-902.26	3002.26	CMP-12	2476
PD-851	2631	PD-888	2779	PD-902.27	3002.27	CMP-13	2360
PD-852	2191	PD-889	2757	PD-902.28	3002.28	CMP-19	2530
PD-853	2639	PD-890	1501	PD-902.29	3002.29	CMP-20	2549
PD-854	2664		Supp. I	PD-902.31	3002.31	CMP-21	2538
PD-855	2663	PD-900	3000	PD-902.32	3002.32	CMP-22	2681
PD-856	2289	PD-900.01	3000.01	PD-902.33	3002.33	CMP-23	2593
	Supp. I	PD-900.02	3000.02	PD-902.37	3002.37	CMP-24	2685
PD-857	2581	PD-900.03	3000.03	PD-902.40	3002.40	CMP-25	2714
PD-858	2571	PD-900.04	3000.04	PD-902.41	3002.41	CMP-26	2787
PD-859	2522	PD-900.05	3000.05	PD-902.06	3002.06	CMP-27	2767
PD-860	2682	PD-900.06	3000.06	PD-903	3003		
PD-861	2657	PD-900.07	3000.07	UF-1	1790		
PD-862	2705	PD-900.08	3000.08	UF-2	2498		

## OPA to Establish Advisory Committees

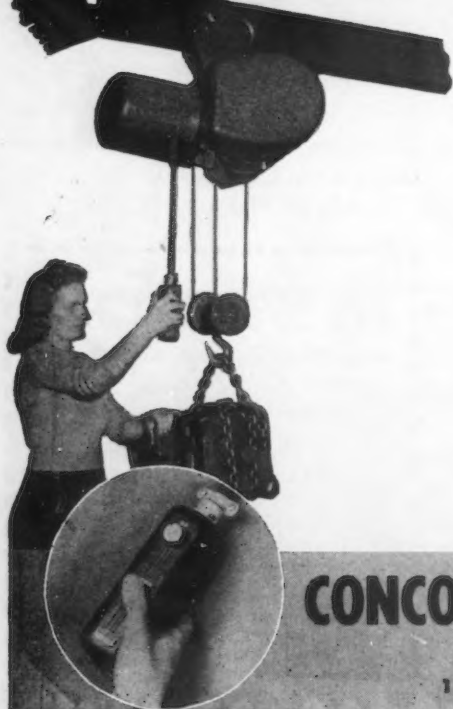
### Washington

• • • Rapidly extending the use of industry advisory committees, OPA last week set up machinery for the formation of advisory committees to cover all industries affected by OPA price regulations.

At the same time, OPA announced that opportunity would be given for consultation with representatives of organized labor through the OPA Labor Policy Committee, established more than a year ago, and through sub-committees to be set up by the Labor Policy Committee. The sub-committees are to be composed of representatives of particular unions interested in particular price regulations.

While the price control act requires OPA to set up advisory committees on the request of representatives of an industry, under the policy inaugurated by Mr. Brown, advisory committees will be set up for all industries whether or not a request has been made.

# Here's Safe Easy Strength... FOR THE WEAKER SEX



The Conco Torpedo Electric Hoist has many features which adapt it ideally to operation by women. First, push button control allows for easy, one-hand operation. Double cast iron drums balance the load with a minimum of effort from the operator. An electric brake and positive limit switch are important safety features. Available for prompt delivery in 250-, 500- and 1000-lb. capacities for hook, bolt or trolley suspension. Write for bulletins.

## CONCO ENGINEERING WORKS

Division of H. D. Conkey & Company  
15 GROVE STREET, MENDOTA, ILLINOIS



Illustrating four units of Conco's complete line of hand-powered and electric cranes, hoists and trolleys. Write for bulletins on the equipment needed.





# Acme for Action



Quick action on attack brings many glorious victories to our gallant navy. And quick action on the production front in supplying needed equipment spurs the confidence of our boys for those further victories that will drive the enemy from sea, land and air.

Action here at Acme means we are breaking all previous records in producing tools, tool engineering, patterns and heat-treated aluminum castings, to help war production plants deliver essential equipment on time.

Our service is complete -- including engineering service of long experience. Don't hesitate to call on Acme to keep your bottlenecks down -- to step your production up.

**ACME PATTERN & TOOL COMPANY, Inc., DAYTON, OHIO**  
Heat-Treated Aluminum Castings—Patterns—  
Tools—Tool Designing—Production Processing

For  
VICTORY  
buy  
WAR BONDS  
and STAMPS

## Six New Heavy Line Warehouse Price Zones Established in Nation

### Washington

• • • Dollars-and-cents ceiling prices for prime quality heavy steel products sold by heavy line steel warehouses in six newly-created pricing zones were announced last Friday by the Office of Price Administration.

The new prices continue to maintain ceilings in line with those charged

by warehouses on April 16, 1941, the OPA base pricing date for the steel industry, and, at the same time, effect greater uniformity and simplification in pricing procedure.

The new zones are established in Amendment No. 16 to Revised Price Schedule No. 49 and become effective June 21.

The six new zones provide specific prices for 18 States and parts of 5 others in the East Central, Central, and Western regions of the nation—a territory flanked by the New England States on the East, the Southern States on the South, and the Far Western States on the West. In the territory covered by the six zones are centered the bulk of the country's steel producing mills, distributing warehouses, and heavy steel consuming industries.

The new zones are as follows:

**Zone 5.** Thirty-eight counties in New York state, 30 counties in Pennsylvania, 2 counties in Maryland, 18 counties in Virginia, the entire states of West Virginia, Kentucky, and Ohio, 49 counties in Indiana, and 43 counties in Michigan.

**Zone 6.** The entire state of Illinois except the cities of Brooklyn, East St. Louis, Granite City, Madison, Monsanto and Venice; 62 counties in Wisconsin, 50 in Missouri, 12 in Nebraska, 13 in Minnesota, the entire state of Iowa except the Metropolitan area of Council Bluffs, 14 counties in North Dakota, 53 counties in South Dakota, 40 counties in Michigan, 43 in Indiana, and the entire states of Montana, Wyoming, Arkansas, Oklahoma, and Kansas.

**Zone 7.** Seventy-four counties in Minnesota, 39 in North Dakota, 16 in South Dakota, and 9 in Wisconsin.

**Zone 8.** Sixty-five counties in Missouri and the following cities in Illinois: Brooklyn, East St. Louis, Granite City, Madison, Monsanto and Venice.

**Zone 9.** Eighty-one counties in Ne-

braska, also the Metropolitan area of Council Bluffs, Iowa.

**Zone 10.** The entire state of Colorado.

Eventually the entire nation will be contained in zones for the pricing of steel products sold by warehouses. Zones 1, 2, 3 and 4 were established April 15, providing dollars-and-cents ceilings for warehousemen along the Eastern Seaboard, and covering states from Maine to North Carolina. Zones with prices for the Southern and Pacific Coast States—the only ones now unzoned—are being drawn, and will be issued at a future date.

The six new zones together with their ceiling prices, were drawn after consultation of OPA with members of the warehousing industry in each marketing area.

### CMP Developments

• Direction 12 to Reg. 1 provides water well drillers with necessary controlled materials by filing a CMP-4B application.

• Direction 4 to Reg. 5 contains the rule that steel stitching wire used by printers and publishers is an operating supply coming under provisions of Reg. 5 (Release No. WPB-3796).

• Direction 9 to Reg. 1 has been corrected to indicate that wire mills may accept orders for wire mill products which they do not produce, if they are able to arrange to have the required item produced by another mill.

• Direction 5 to Reg. 5 makes it easier for farmers to obtain supplies of needed farm machinery by holding that the same Priorities Reg. 19 will also be used to obtain maintenance, repair and operating supplies for such machinery.

• Direction 17 to Reg. 1 clarifies the rules applicable to delayed shipments by brass mills.

• Direction 15 to Reg. 1 holds that a producer of controlled materials who on Jan. 1, 1943, maintained a mill stock of steel products may continue to maintain this stock at any location he wishes, provided title to the stock has not been transferred to a consumer of steel or a warehouse.

• Direction 18 to Reg. 1 provides for a tentative acceptance of orders for steel, even though in so doing a mill will exceed the monthly quota of 110 per cent.

• Direction 16 to Reg. 1 further defines the method of replacing defective controlled materials.

• Direction 14 to Reg. 1 holds that a rerating is not compulsory in connection with allotments.

• Inventory Direction 9 to Reg. 2 stipulates that until Dec. 31, 1943, the inventory restriction of the regulation shall not apply to the acceptance of deliveries of aluminum rivets acquired for use in the production of aircraft or aircraft components. (Release No. WPB-3860)

• Direction 13 to Reg. 1 requires that requests for Complete Bills of Materials must, in all cases, originate with a claimant agency. (Release No. WPB-3841)

• Int. 3 to Reg. 3 rules that beginning with the third quarter, war contractors will be expected to continue placing the allotment numbers on their orders for controlled materials.

• Reg. 5A, which sets up procedures by which governmental agencies and institutions may obtain maintenance, repair and operating supplies, has been amended to bring it into conformity with the changes effected on May 14 in Reg. 5. (Release No. WPB-3820)

### Priority Changes

**L-13-a**—Int. 1 further defines the metal office furniture that may be produced. (6-12-43)

**L-41**—Amendment to field administrative order 708-20 permits construction under this order.

**L-59**—Order revoked. (6-11-43)

**L-59-b**—Amended order modifies controls over metal plastering bases. (6-11-43)

**L-53-a**—Amended order permits production of certain models and types of track-laying tractors. (6-10-43)

**L-123**—Amended order permits farmers to obtain items of general industrial equipment frequently used on farms without furnishing A-1-c priority ratings, required by others. (6-7-43)

**L-192**—Construction Machinery Division authorizes the certification of telegrams when purchasers want to obtain construction machinery repair parts to meet an actual or impending breakdown. (6-11-43)

**L-193**—Amended order permits steel to be used in the manufacture of guards or housings on mechanical power transmission drives. (6-11-43)

**L-250**—Int. 1 clarifies the prohibition on the use of floor mounting types of enclosing steel cases or cabinets for various kinds of electric controllers with respect to the types of cases coming under the order.

**L-292**—Order places new controls over production and distribution of new and used processing machinery for food, beverages and tobacco. (6-5-43)

**L-300**—Order establishes controls on the manufacture of certain items of electric circuit-breaker equipment. (6-10-43)

**M-81**—Amended order increases the number and quantities of non-food products which can be packed in cans during 1943. (6-7-43)

**M-261**—Amended order permits use of steel strapping for several additional purposes. (6-7-43)

**Amendment 1 to Reg. 19** lists further farm supplies which a person may obtain by certifying that he is a farmer. (6-8-43)

**Int. 2 of Priorities Reg. 3** holds that all unfilled orders on June 4 will be treated as new orders after that date. (6-12-43)

### Price Briefs

• Amendment 12 to Revised Supplementary Reg. 1 exempts from price control steel valves, valve parts and subassemblies when sold by new subcontractors to valve manufacturers under contract with the Navy Department. (Release No. OPA-T-999)

• Sellers of expeditionary or "blitz" cans rejected by the Armed Forces are now required to price these rejects for sale under the General Maximum Price Regulation. (Release No. OPA-T-1026)

• Amendment 6 to Maximum Price Reg. 246 permits a reduction on manufacturers' and wholesale prices for farm equipment to compensate for a change in freight rates.

• Maximum Price Reg. 351 has been amended to provide for a reduction in freight rates when computing maximum prices for ferrous forgings.

• Amendment 90 to Maximum Price Reg. 136, applying to machines and parts and machinery services, compensates for a reduction in freight rates in computing prices.



# METAL SPECIALTY

*fulfilling exacting  
requirements*

*for*

## INDUSTRY

*in*

### PLASTIC MOLDING

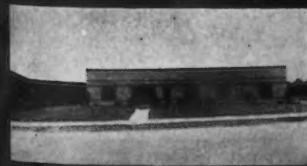
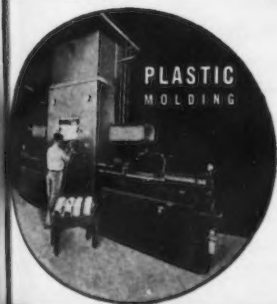
*and*

### METAL WORKING

Drawing • Coining  
Rolling • Forming  
Stamping • Welding

Metal Specialty's plants are equipped to render you complete service in the fabrication of all Metal Parts, and in Plastic Injection Molding up through 18 ounces per shot. Along with 850-ton self-contained hydraulic presses for Metal Working, Metal Specialty has one of the four 18-36 ounce capacity injection presses for Custom Molding together with full complementary equipment.

Assembled Jobs • Pressed Metal to Order



*The*  
**METAL SPECIALTY Co.**

MAIN OFFICE AND PLANT • ESTE AVENUE • CINCINNATI, OHIO



## L-257 Issued to Assure Farm Program

### Washington

• • • A farm machinery and equipment order was issued Tuesday by WPB to implement the farm machinery and equipment requirements of the War Food Administration program, as announced last week. Effective July 1, the new order, L-257, cuts short the life of its predecessor, L-170, by three months; however, it permits the uncompleted quotas under L-170 to be produced in addition to the quotas which it establishes.

The production quotas established by L-257 are based on the actual needs of the farmers of this country for farm machinery and equipment

*See story on Farm Equipment appearing on p. 99.*

as determined by the WFA and have had the approval of the vice chairman for Civilian Requirements so far as they affect other civilian needs.

The percentages for production quotas of specific items named in Schedule A attached to L-257 are worked out on the basis of the advance over-all authorization of 900,000 tons of carbon steel made to the industry for the period July 1, 1943, to June 30, 1944, as announced by WPB last week. L-257 unlike L-170 contains no concentration provision but it does allow higher percentage for the production quotas of "small producers."

Among the other things it does are the following:

Permits a producer to manufacture any item of farm machinery and equipment

for sale in the United States up to the percentage indicated for that item in Schedule A. These quota percentages are expressed in terms of the total net weight of the items manufactured by him during either 1940 or 1941, whichever was higher.

Brackets a large number of items in Schedule A to allow producers the maximum flexibility on planning their production.

Provides that production of any item of farm machinery and equipment and repair parts must be in accordance with production schedules approved by the WPB (these production schedules must also include non-farm machinery and equipment as defined in the order).

Removes restrictions on the manufacture of repair parts for sale in the United States except to the extent that sched-

ules for the production and delivery of such repair parts must be approved by WPB.

Defines "small producers" to mean any producer whose total net sales (including export and sales by affiliates) of all products did not exceed \$100,000 during the calendar year of 1941. Includes in the definition any other producer classified by the Smaller War Plants Corp. as such.

Permits any small producer to substitute for the quota percentages listed on Schedule A a special quota but the amount of all items must not exceed in the aggregate 100 per cent of his total base production.

Provides for scheduling of production and delivery for the 12-month period starting July 1. Items scheduled for farm use may not be diverted. Producers of farm machinery and equipment are permitted to schedule as though purchase orders bore a rating of AA-2 but this permission does not assign delivery ratings to the purchase orders themselves.

## Tentative Orders Approved for Steel

### Washington

• • • A steel producer who is unable to accept an order for delivery in a particular month because the schedule for that month is full is required to book the order tentatively as early as possible in the succeeding or second month following by procedure outlined in Direction No. 18 to CMP Regulation No. 1.

Previously, the regulation required a producer to refuse an order for a particular month after his schedule for that month had been filled, even though there was room on the schedule for the first or second month thereafter. In a number of cases, by the time the order had again been placed for a later month, the producer's schedules were again filled.

The tentative acceptance procedure

required by the new direction is expected to correct the situation. Upon notification of the month for which the order has been tentatively accepted, the customer furnishes the producer with written confirmation within seven days.

## New Instructions Issued For Filing Bills of Material

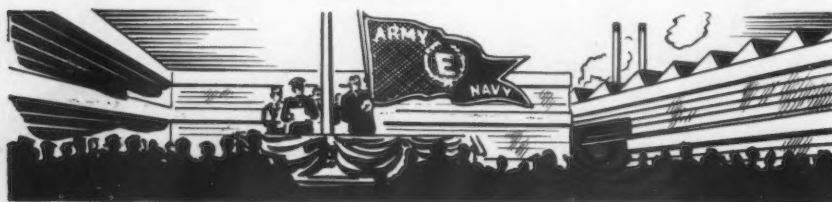
• • • Instructions for preparing Bills of Materials under CMP have been simplified in an instruction booklet, which supersedes General Instructions on Bills of Materials.

The new instructions authorize Claimant Agencies to obtain Complete Bills of Materials on major repetitive products such as airplanes, tanks and guns. It is pointed out that if a producer is asked to submit a Complete Bills of Materials, he must show the requirements for the manufacture of Class B components as well as for the manufacture of Class A components. This constitutes a major change from past practice under which material requirements for Class B components could not be required in Bills of Materials.

## M-21-b-2 Aids Warehouses

### Washington

• • • Steel warehouses distributing merchant trade products will now be able to replace on an equal basis stocks sold on any type of authorized controlled material order. This action, order M-21-b-2 as amended, was taken by WPB on Tuesday because warehouses selling material on orders bearing Claimant Agency allotment numbers had an advantage in replacing stocks over warehouses whose trade was largely in MRO and other types of authorized controlled material orders.



## ... Cited for Awards ...

• • • The following companies have been recently awarded the Army-Navy "E" award for excellence in war production:

Eagle Precision Tool & Die Co., Long Island City, N. Y.

Fletcher General Hospital Construction project, Cambridge, Ohio.

Hawaiian Air Depot, Hickam Field, T. H.

Liberal Air Field Construction Project, Liberal, Kan.

Ozark Ordnance Works Construction Project, El Dorado, Ark.

Brown Steel Tank Co., Columbus.

### Maritime Commission "M"

Pennsylvania Range Boiler Co., Philadelphia.

Wickwire Spencer Steel Co., Palmer Wire

Rope plant, Palmer, Mass. (gold star)

Ingalls Iron Works Co., Birmingham, Ala.

Birmingham Tank Co., Birmingham, Ala.



## AA-2 Rating for Urgent Programs

### Washington

• • • In order to avoid creation of a new "super" priority rating to care for the most urgent programs, the rating of AA-2 was recently restored by amendment of Priorities Regulation No. 1. This change provides a bracket between the AA-1 and AA-2X bands, and provides for increased flexibility in the whole structure. The AA-1 bracket is now reserved for the most pressing military production and for certain other essential needs, such as shipments under Russian Protocol and maintenance of specified

production and service facilities.

WPB officials said that as a result of the changes announced requests for the up-rating of programs will be reduced to a minimum, once the new rating structure is applied. They pointed out further that, under CMP, only as much material is allotted as is available at the mills, and that a manufacturer obtaining an allotment number is assured delivery of copper, steel and aluminum, regardless of preference ratings, provided his orders are placed with mills within the time limits specified by CMP regulations.

• • •

## Prices Reported Filed For Heavier Tinplate

• • • Two tinplate producers are reported to have filed a price with OPA for .75 lb. electrolytic tinplate of \$4.65 per base box and that at least one other producer is also considering entering into the manufacture of this new, experimental grade at a similar price. The .75 lb. grade is said to represent a happy medium between .50 lb. electrolytic and the heavier hot dipped grades and is expected to provide suitable material for many food canning purposes not adequately handled by the light weight electrolytic plate.

## New Ferrosilicon and Ferro-Chromium Prices Set

### Washington

• • • OPA has announced new zoned dollar and cent prices for ferrosilicon and silicon metal and a similar series of prices for ferro-chromium and chromium metal in price actions which will become effective July 1. The new ferrosilicon prices are contained in Maximum Price Regulation No. 405 while the chromium prices are established in Maximum Price Regulation No. 407, both effective on the same date.

Under the new system three zones are established, namely: Eastern Zone, including Mississippi River points and all points East of the Mississippi; Central Zone, west of the Mississippi to a line formed by the western boundaries of New Mexico, Colorado, Wyoming and directly north to the Canadian border; Western

Zone, all territory west Central Zone.

Within these zones actual dollars and cent prices are set for all grades of ferrosilicon except the 15 per cent grade which is not produced in an electric furnace. Similarly, ferro-chromium and chromium metal prices are established according to zone and a specified list of grades. Prices are said to be approximately the same as have existed in the trade. Usual premiums for spot sales, packing and quantity differentials apply.

## Allotment Numbers Required On Orders With Ratings

• • • WPB announced on Tuesday that manufacturers of Class A or Class B products must continue to identify all rated orders for production materials with the allotment number assigned to the related production schedule under CMP. This is true despite the fact that allotment numbers on rated orders placed after June 30 will have no uprating effect.

## Use of Ratings Limited in Obtaining Re-Sale Products

• • • Manufacturers, permitted to use preference ratings assigned authorized production schedules to obtain products to round out a line, may not use their ratings indiscriminately to compel suppliers to furnish them with products for resale which they normally are able to produce themselves. This point was brought out last week by the CMP division of WPB in Interpretation 2 to CMP Regulation No. 3.

This ruling, clearly indicates that the provision permitting a manufacturer to acquire items for resale up to 10 per cent of his total sales, may not be used by persons operating ser-

vice repair shops or similar enterprises which do not manufacture products for sale. In such instances, the person desiring to acquire materials to round out a line must do so as a distributor with respect to the entire quantity. This also holds true with respect to manufacturers who desire to obtain materials exceeding 10 per cent of sales to round out a line.

## Mills May Replace Sales Made from Over-Rolling Stocks

### Washington

• • • Action was taken by WPB on Monday to permit steel producers to replace sales made from mill stocks of over-rollings, by Direction No. 15 to CMP Regulation 1. Over-rollings result from the practice in the industry of producing sufficient quantities of steel to meet authorized requirements. Part of these over-rollings normally is shipped to warehouses and the balance held in mill stocks either at the mill or another location.

The action permits producers to replace shipments from mill stocks within 60 days from the date of shipment. Title to the stock must not have been transferred to a steel consumer or to a warehouse and the quantity of steel maintained must not exceed the average inventory of the product between Jan. 1 and May 1.

The direction does not apply to producer-owned stocks of steel products held on consignment by a distributor, as these stocks are subject to CMP Regulation No. 4 and General Preference Order M-21-b-1 and M-21-b-2.

## Only Claimant Agencies May Ask Complete Bills

• • • Request for Complete Bills of Materials must, in all cases, originate with a Claimant Agency, according to the terms of Direction No. 13 to CMP Regulation No. 1, issued last Friday by the CMP division of WPB.

The direction provides that a consumer must not request a Complete Bill of Materials from his suppliers unless he, in turn, has been requested to furnish his customer with a Complete Bill of Materials. The direction also points out that applications for allotments must not include controlled material requirements for the manufacture of Class B components, even though a Complete Bill of Materials has been requested.

# PERSONALS

• **J. L. Trecker** has been appointed executive vice-president of the Kearney & Trecker Corp. **R. W. Burk** was made vice-president in charge of sales; **E. W. Trecker**, vice-president in charge of manufacturing; **J. B. Armistage**, vice-president in charge of engineering, and **R. L. Bischoff** was appointed treasurer and assistant secretary. **J. L. Trecker** joined the company in 1924. He was appointed advertising manager several years later, became treasurer in 1934 and vice-president in 1936.

• **Clarence E. Levoe** has been appointed to the staff of Battelle Memorial Institute, Columbus, Ohio, and assigned to research on the high-temperature properties of metals.

• **Edwin B. McConville** was recently elected treasurer of Skilsaw, Inc., Chicago. Mr. McConville brings to his new position the background of 25 years of financial and merchandising experience, having been treasurer of Finch, Van Slyck and McConville, St. Paul, until he joined Skilsaw as comptroller in 1942.

• **H. J. Barnsley**, vice-president of Jenkins Bros., has been elected to the governing board of Jenkins Bros. Ltd., of Montreal. Mr. Barnsley came to Jenkins Bros. 25 years ago from the Crane Co. where he was chief drafting engineer. Previously he was connected with the American Graphophone Co., and the Locomobile Co.

• **Albert V. Beet** has been appointed general superintendent of Arrow Head Steel Products Co., Howell, Mich. Mr. Beet was formerly superintendent of the Canadian plant of Thompson Products, Ltd., St. Catharines, Ontario, and superintendent of the Howell Electric Motors Co., Howell, Mich.

• **L. C. Goad** was recently elected a vice-president of General Motors Corp. Mr. Goad is general manager of the Eastern aircraft division of General Motors, with headquarters at Linden, N. J.

• **A. R. Rose**, formerly with the Edward G. Budd Mfg. Co., Philadelphia, and the York Corrugating Co., York, Pa., has joined the Edward A. Lynch Machinery Co., Ardmore, Pa., as equipment engineer in the distribution of the various lines of power driven and metal working machinery.

• **Charles Crook, Jr.**, who for many years has been with the design and engineering department of several machine tool builders, notably Newton



**J. L. TRECKER**, executive vice-president of Kearney & Trecker Corp., Milwaukee.

Machine Tool Co., and Jones Machine Tool Co., Philadelphia, has joined the Edward A. Lynch Machinery Co., Ardmore, Pa., as equipment engineer.

• **Donald K. Ballman**, identified with product development and technician service with Dow Chemical Co., has been named head of Dow's newly formed service and development division, to be concerned exclusively with development of new chemical products for current and post-war use. The Dow Magnesium Corp. has appointed **F. H. Langell** plant manager of the Ludington plant and **M. O. Robinson** plant manager of the new Marysville plant.

**ROBERT K. KULP**, recently appointed director of research of the Jessop Steel Co., Washington, Pa.



• **Dr. J. J. Pyle**, former group leader in charge of research and chemical development, has been appointed chemist in charge of the plastics laboratory, plastics division, General Electric's Appliance & Merchandise department. He succeeds **Dr. G. F. D'Alelio**, who has resigned from the company. **J. W. Underwood** was named administrative assistant to Dr. Pyle. Dr. Pyle came to Pittsfield in 1939 from Lynn, Mass., where he was production and development chemist in the plastics laminating division. Mr. Underwood came to Pittsfield in 1937 and served as a research and development chemist in General Electric's Pittsfield Works Laboratory.

• **E. J. Ellertson**, who has been purchasing agent for Caterpillar Tractor Co., Peoria, Ill., and predecessor companies since 1906, assumed the newly created position of general purchasing agent recently. In his new capacity, Mr. Ellertson will assist **J. V. Munro**, vice-president in charge of purchasing. **W. H. Steele**, assistant purchasing agent, has been appointed to the position of purchasing agent.

• **Dr. Robert F. Ruthruff** has been appointed director of research for the Sherwin-Williams Co., Cleveland, and its allied companies. Dr. Ruthruff is a graduate of the University of Michigan, as well as a former member of the teaching staff of that institution. Prior to joining the Sherwin-Williams organization in 1939 he was associated with E. I. du Pont de Nemours & Co., Standard Oil Company of Indiana and the M. W. Kellogg Co. Dr. Ruthruff was formerly in charge of oil research for the Sherwin-Williams Co.

• **Harold E. Hall** has been elected president of Metals Disintegrating Co., Inc., Elizabeth, N. J. Mr. Hall has been general manager of the company for the past six years, and has been active in various societies and organizations concerned with metal powder production.

• **John E. Wells**, formerly manager of the "Budgit" hoist division of Manning Maxwell & Moore, Inc., Muskegon, Mich., has been appointed advertising manager of the Aviation Corp., Detroit. Mr. Wells was with Manning Maxwell & Moore for five years. Prior to 1938 he was with the Ex-Cell-O Corp., for ten years.

• **Robert H. Gibb**, manager of Allegheny Ludlum Steel Corp.'s Pittsburgh district sales office, has left to accept a commission in the United States Navy. Mr. Gibb has been a member of Allegheny Ludlum's Pittsburgh district sales organization for



several years, having filled the post of assistant district manager until his appointment last January to the managership. **Max Pischke** has assumed the duties heretofore performed by Mr. Gibb, with the title of acting district manager. Mr. Pischke has been connected with the Allegheny Ludlum Pittsburgh sales office for the past two years.

- **John S. Gregg** has been appointed as district sales manager of the Inland Steel Corp. Cincinnati sales office. Mr. Gregg has been associated with Inland Steel since 1935, coming to Inland after having worked with the Moise Steel Company, Milwaukee, Wis. Up to the time of his transfer to Cincinnati, he was covering the Wisconsin territory out of Inland's Milwaukee sales office. **Kenneth J. Burns**, former Cincinnati district sales manager, is now located in Chicago in an executive capacity in the plate and shape sales division.

- **H. B. Shepherd**, of Jones & Laughlin Steel Corp., has been appointed district manager of sales of their Washington, D. C. office to succeed J. B. DeWolf who resigned. Since March, 1942, Mr. Shepherd has been assistant district sales manager of the Washington office.

- **Fred H. Johnson** has been appointed assistant chief engineer of the Pittsburgh District, Carnegie-Illinois Steel Corp., effective June 1. He began his career in steel in 1913, and in 1940 joined the Carnegie-Illinois Steel Corp., working in the engineering department of South Works, in Chicago. Two years later he was transferred to Pittsburgh and placed in charge of the defense engineering staff, holding that position until his present assignment.

- **Melvin G. Willigman** has been named to the staff of Battelle Memorial Institute, Columbus, Ohio, and assigned to its division of mineral dressing research. Mr. Willigman was formerly associated with the U. S. Bureau of Mines.

- **George D. Austin**, supervisor of production of General Electric Co., Pittsfield, Mass., has been made assistant to the production manager.

- **Willard A. Luli**, engineer with Cooper-Bessemer Corp. for the past eight years, has been promoted to the post of factory production representative for the company's two plants at Mount Vernon, Ohio and Grove City, Pa. In his new assignment, Luli is affiliated with the company's Washing-

ton, D. C. office where he serves as Cooper-Bessemer representative on the WPB for the large diesel engine manufacturers' planning and scheduling committee.

- **George Johnstone, Jr.**, formerly assistant foundry superintendent at the Grove City, Pa., plant of the Cooper-Bessemer Corp., has been promoted to the position of foundry superintendent. Before joining Cooper-Bessemer, Mr. Johnstone served as foundry superintendent for William A. Hardy & Sons Co., Fitchburg, Mass. He was also instructor in foundry practice and technology at Girard College, Philadelphia, for several years.

- **R. H. Sonneborn**, well known for many years in the industry, will direct the sales of Chicago Nipple Mfg. Co., according to an announcement by J. Lester Williams, Jr., president.

- **Isadore Davis** has resigned his position as special assistant to the director of the Tin-Lead Division of the War Production Board and has joined the organization of the Reynolds Metals Co., Louisville, Ky. Mr. Davis was with the WPB for close to two

years. In his new position with the Reynolds Metals Company, Mr. Davis will confine his activities chiefly to purchasing and converting secondary metals.

- **Edward J. Nunan**, sales engineer of the Buffalo Slag Co., has been elected president of the Erie County Chapter, New York State Society of Professional Engineers.

- **Frank Parker** recently became chairman of Iron & Steel Products, Inc., Chicago. Other officers are **Albert G. Bladholm**, president; **John F. Parker**, vice-president and treasurer; **William J. Parker**, vice-president and secretary and **Royal J. Casper**, assistant secretary.

- **Elvin E. Hallander** was recently appointed vice-president of the Star Electric Motor Co. and its affiliate, the Star Equipment Corp., Bloomfield, N. J. Other officers are **Ivor C. Peterson**, vice-president in charge of sales; **R. J. Gash**, secretary and treasurer.

- **Dr. J. J. Pyle**, in charge of research and chemical development in the plastics division, General Electric Co., Pittsfield, Mass., has been placed in charge of the plastic laboratories.

## OBITUARY...

- **Edmond J. Caspari**, superintendent of the construction machinery plant of the Chain Belt Co., Milwaukee, died May 31, aged 36 years. He had been with the firm for 14 years.

- **Harry S. Hitchcock**, president of Apex Steel Corp., Los Angeles, died last week of a heart attack. He was 72 years old. He had been connected with the Los Angeles steel industry since 1902, having formerly been vice-president of the old Baker Iron Works.

- **George W. Connors**, chairman of the board, Connors Steel Co., Birmingham, died recently at his home in Birmingham. Mr. Connors was one of the founders of the Atlantic Steel Co., Atlanta. He later founded the Connors Steel Co. in 1907 and remained its leader until his death. He was 78 years of age.

- **Robert Emerson Brown**, Pacific Coast division manager of Electro Metallurgical Sales Corp., New York, died May 26 at Belmont, Cal. He was

46 years old. Mr. Brown began his association with units of Union Carbide and Carbon Corp. in 1920, when he took a position with Electro Metallurgical Co. at Niagara Falls, N. Y. After a short time he was transferred to the Pacific Coast division. At the time of his death Mr. Brown was also district sales manager for the Electrode Division of National Carbon Co., Inc., another unit of Union Carbide and Carbon Corp.

- **Ervin H. Thorp**, formerly an officer in the Passaic Cotton Mills and the American Tire Fabric Co., died recently at his home in Montvale, N. J. Mr. Thorp retired from active business life in 1928. He was 85 years old.

- **Harold H. Shotwell**, civilian chief of priorities of the Army Air Forces central procurement district, died near Detroit June 6. He came to the Air Forces three years ago from private employment as an electrical engineer.

- **Fred Seegert**, died at his home in Racine, Wis. recently, aged 85 years. He was formerly an engineer with Vilter Mfg. Co., Milwaukee, and later with the Horlick Milk Co., Racine. He retired in 1931.

# MACHINE TOOLS

... News and Market Activities

## Tool Industry Awaits Clarification Of Government Renegotiation Policy

### Cleveland

• • • The machine tool industry, the first from an industry standpoint to go through the rigors of renegotiation, awaits the outcome of the investigations of renegotiation of contracts now under way in Washington. Some companies have asked for a deferment of final renegotiation to see what comes of the meetings. The builders hope that there will be some leniency with regard to postwar conversion. Just how justified they are in holding out such hope only time will tell, but in any case renegotiation is bound to dip into already scarce cash reserves to such an extent that real assets may have to be liquidated before conversion to any kind of a postwar manufacturing program can be instigated.

In the investigation hearings last week, the right of WPB to exercise authority over the formulation of policies of price adjustment boards of the Army, Navy, and Maritime Commission in regard to provisions for postwar conversions to civilian production was challenged. The House Naval Affairs Committee is conducting the renegotiation investigation. The basis for the challenge was a letter by WPB Chairman, Donald M. Nelson, written in March, 1942, stating that the cost of re-conversion of industry to postwar operations should not be borne by the government, either directly or indirectly. Such costs should not be charged to war production, but should be borne by the contractors and charged against postwar business, the letter read. It was claimed that this letter was the basis for the Navy Price Adjustment Board's policy of disallowing in contract renegotiations for postwar adjustments.

This condition might well be to the letter of the law, but according to Herbert Taylor, assistant to the chief of the War Department Price Adjustment Board, the various price adjustment boards are definitely allowing for postwar conversion in renegotiating various manufacturers contracts. He stated that, while the law has no such provision, the War Department Board's policy has been to be lenient in other considerations, so that reserves for postwar conversion will actually accrue.

The Navy's policy of making no provisions for postwar conversion in renegotiation of contracts was heavily attacked in the committee hearings. Unless such adjustments were made, it was stated, the government would be in complete control of postwar economy. Kenneth H. Rockey, chairman of the Navy Price Adjustment Board, outlined the procedure of renegotiation, explaining that the board takes into consideration the contractor's business, place of industry, dividend policy, contribution to the war effort, pre-war profits, and many other details, but when asked what the formula or process of renegotiation was, he, like Mr. Taylor of the

## Capacity Production Maintained at Good Rate

### Cincinnati

• • • District machine tool plants continue to maintain capacity production of tools despite some rumors to the contrary. A check-up on machine tool plants in this area, in the face of some reports of reduction of labor forces, reveals the rumors are merely rumors and that the plants have not reduced forces, but as a matter of fact, in many instances the need for further good employees is apparent.

The influx of new business is reported to be at a very satisfactory level, although plants are now definitely eating into their heavy backlogs. By and large, the continued high rate of production is expected to prevail for the remainder of this year and in all probability, well into next year. In a few instances where manufacturers have been easing up on the production of new tools, their plants are continuing to be busy in fabricating other war products or machining parts for other manufacturers.

## Machine Tool Industry Slated to Be Kept Busy

### Washington

• • • Despite talks of drastic cutbacks in machine tool orders, demands for the rest of the year are still going to be fairly large, according to high government officials. Current

War Department Price Adjustment Board, explained that no two cases are alike and contracts are treated individually.

Undersecretary of the Navy, James V. Forrestal, told House Naval Affairs Committee members that he would like some automatic machinery or formula for the elimination of excess profits in war industry, but since there is none, the present legislation is the best solution thus far found and is working comparatively well. He asserted that he doesn't favor the cost-plus-fixed-fee contract because it offers no incentive to reduce costs, but it was the only basis on which some contracts could be made.

While the RFC, DPC, and Lend-Lease Administration are not governed by the Renegotiation Act, Forrestal stated that he would not suggest the extension of the act.

orders are about 50 per cent of shipments, and the average backlog is about five months. Some Detroit manufacturers still need thousands of machine tools.

On the other hand, at least 75 machine tool builders have been told by WPB that they can now take on outside work, and a government agency has been set up to facilitate this transfer. Some of the more aggressive companies have already taken on outside contracts and others are being counselled where to obtain subcontracts. Some of the products which machine tool makers are equipped to manufacture include valves, hydraulic controls, steam turbines, gear sets and diesel engine parts. But the largest bulk of new work is in helping other machine tool builders not so well situated as regards deliveries. The demand for single-purpose machines has gone up markedly in the last six months and the bottleneck today is in fixtures and special accessories for such tools.

Some machine tool builders will be swung over to the manufacture of large parts for high power aircraft engines.

In the shiftover of the industry to direct war work there is bound to be some unbalances, creating idle equipment in some instances and the necessity of purchasing new tools in other departments. The hardest job will be to keep the large machine tools busy.



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# MARVEL SAWS

## How would you do it?

*(Cutting an I-Beam that has been rolled into a large diameter ring into segments. A typical example of the versatility of the No. 8 MARVEL Band Saw)*

At the Kling Bros. Engineering Wks., Chicago, manufacturers of rolled structural shapes, three MARVEL No. 8 Metal-cutting Band Saws are proving "A-1" and "100%". In the MARVEL System there are saws exactly suited to every shop's need—and for structural shapes, the universal MARVEL No. 8 is ideally suited, because it handles all work up to 18" x 18" cross-section and does cutting-off, mitering and notching. The blade feeds into the work at any angle from 45° right to 45° left. It is the most versatile metal-cutting saw built.

**ARMSTRONG-BLUM MFG. CO.**

*"The Hack Saw People"*

**5700 Bloomingdale Ave. Chicago, U. S. A.**  
Eastern Sales Office: 225 Lafayette St., New York

**No. 1**  
Cap. 4" x 4"

**No. 2**  
Cap. 8" x 8"

**No. 4B**  
Light Duty  
High Speed  
Cap. 6" x 6"

**No. 6**  
Heavy Duty  
High Speed  
Cap. 6" x 6"

**No. 6A**  
Automatic  
Bar Feed  
Cap. 6" x 6"

**No. 9**  
Heavy Duty  
High Speed  
Cap. 10" x 10"

**No. 9A**  
Automatic  
Bar Feed  
Cap. 10" x 10"

**No. 8**  
Metal  
Band Saw  
Cap. 18" x 18"

**No. 18**  
Cabinet  
Hydraulic  
Cap. 18" x 18"

# NON-FERROUS METALS

... News and Market Activities

## Mathieson Begins Magnesium Production

• • • Production of magnesium metal at the newly erected magnesium-chlorine plant in Louisiana has begun, according to an announcement by the Mathieson Alkali Works, Inc., the operating company. The plant is owned by the Defense Plant Corp. and has a future capacity of more than 50,000,000 lb. of magnesium metal a year.

The principal raw material is dolomite which is shipped from nearby quarries. This ore is calcined, locally produced natural gas being used for the purpose. The resulting oxides of calcium and magnesium are treated with calcium chloride, a product of the process by which soda ash is made at the parent Mathieson plant. The mass is then treated with carbon dioxide obtained from the calcination of the dolomite, which converts the calcium into insoluble carbonate, leaving magnesium chloride. This product, after being concentrated, is electrolyzed, forming magnesium and chlorine.

Magnesium metal in this plant is manufactured by a process developed by Mathieson engineers which produces not only pure magnesium metal

but also liquid chlorine, both of which are highly essential to the war effort. It is estimated, when running at full production, that this project will employ approximately 1000 workers.

## WPB Ends Paying Higher Scrap Prices

• • • WPB announced that as of Aug. 1, 1943, it would terminate its present practice of paying prices substantially above the current scrap price level for copper stocks, unusable in their present forms, which have been made idle as a result of WPB conservation orders and which are required for remelting for war use.

The government will continue to pay the present higher-than-scrap prices, under the copper recovery program, for certain materials reported to the WPB up to and including July 31 and purchased for remelting. These higher-than-scrap prices will not, however, be offered for materials which have been the basis of any claims on the government for compensation or damages arising out of termination or modification of government contracts. Only reports postmarked before mid-

night of July 31 will be considered as reported on that date.

Holders of idle inventories of copper and copper-base alloys which cannot be used in their present forms and which are reported on and after Aug. 1 will be directed to sell such materials at scrap prices.

## Phelps Dodge to Fabricate Light Metals

• • • Phelps Dodge Copper Products Corp. will engage in the manufacture of aluminum and magnesium tubes, rods and shaped parts, produced by the extrusion process. These parts are required in the airplane industry as well as in other essential production. A new plant with extensive production will be built for the Defense Plant Corp. These mills will be exclusively devoted to aluminum and magnesium and will be operated by Phelps Dodge Copper Products Corp.

The company is a fabricator of copper products, with mills located in New Jersey, New York, Indiana and California. The new plant will add two additional basic metals, aluminum and magnesium, to its fabricated line.

**PRODUCTION MACHINE:** Aluminum rods are loaded into the six barrels of this big "gun," and are changed into aluminum rings for army binoculars by automatic drills, threaders and cutting tools. One machine produces more than 1500 rings in eight hours, each part checking to seventeenths of a thousandth of an inch.

Wide World Photo



## Idle Mercury Stocks Will Be Moved

• • • WPB has acted to move all idle mercury stocks throughout the nation into useful channels. In line with this effort, operators of all gold mines, whether in active production or idle, were requested to report the amount of mercury on hand.

Further, they have been urged to attempt to sell as much of their inventories as possible to dealers or authorized users of the metal. In case owners refuse to sell this material, which is urgently needed in the war effort, the War Production Board may step in and requisition available supplies.

To facilitate the transfer of mercury by holders not regularly engaged in the business of selling mercury, Priorities Regulation No. 13 permits the sale of idle inventories to dealers or other authorized users, WPB pointed out.



## NON-FERROUS PRICES

### Refiner, Smelter Quotations

(Cents per lb.)

Copper, electrolytic, Conn. Valley.....	12.00
Copper, electrolytic, New York.....	11.75
Copper, Lake .....	12.00
Tin, Straits, New York.....	52.00
Zinc, East St. Louis.....	8.25
Zinc, New York .....	8.67
Lead, St. Louis .....	6.35
Lead, New York .....	6.50
Aluminum, virgin 99+%, delivered....	15.00
Nickel, electrolytic, base refinery.....	35.00
Magnesium, 99.9+%, carlots .....	21.50
Magnesium, 12-in. sticks, carlots.....	30.00
Cadmium, delivered .....	90.00

ALUMINUM, No. 12 foundry grade (No. 2), 14.50c. per lb.; steel deoxidizing grades, 12.50c. to 14.75c. per lb. ANTIMONY, Asiatic, New York, nominal; American, 14.50c. a lb. f.o.b. Laredo, Tex., smelter. MERCURY, \$191 to \$193 per 76-lb. flask, f.o.b. shipping point or port of entry. BRASS INGOTS, commercial 85-5-5-5 (No. 115), 12.25c. a lb. COBALT, 97 to 99 per cent, \$2.11 per lb. BERYLLIUM COPPER, 3.75 to 4.25 per cent Be, \$15 per lb. contained Be. GOLD, U. S. Treasury, \$35 an oz. INDIUM, 99.5 per cent, \$10 per troy oz. IRIIDIUM, \$165 per troy oz. PALLADIUM, \$24 per troy oz. PLATINUM, \$35 per oz. SILVER, open market, New York, 44.75c. per oz. ARSENIC, prime, white, 99 per cent, 4c. per lb.

### Copper, Copper Base Alloys

(Mill base prices)

Sheet: Copper, 20.87c.; high brass, 19.48c.; low brass, 80 per cent, 20.15c.; red brass, 85 per cent, 20.36c.; commercial bronze, 90 per cent, 21.07c., 95 per cent, 21.28c.; manganese bronze, 28.00c.; muntz metal, 22.75c.; naval brass, 24.50c.; phosphor bronze, grades A, B, 5 per cent, 36.25c.; Everdur, Herculoy, Olympic or equivalent, 26.00c.; nickel silver, 5 per cent, 26.50c.

Rods: Copper, hot rolled, 17.37c.; drawn, 18.37c.; free cutting brass, 15.01c.; low brass, 80 per cent, 20.40c.; red brass, 85 per cent, 20.61c.; commercial bronze, 90 per cent, 21.32c., 95 per cent, 21.53c.; Muntz metal, 18.87c.; naval brass, 19.12c.; phosphor bronze, grades A, B, 5 per cent, 36.50c.; Everdur, Herculoy, Olympic or equivalent, 25.50c.; nickel silver, 5 per cent, 28.75c.

Extruded Shapes: Copper, 20.87c.; architectural bronze, 19.12c.; manganese bronze, 24.00c.; Muntz metal, 20.12c.; naval brass, 20.37c.

### ALUMINUM

Tubing: 2 in. O.D. x 0.065 in. wall; 2S, 40c. per lb. (1/4H); 52S, 61c. (O); 24S, 67 1/2c. (T).

Plate: 0.250 in. and heavier; 2S and 3S, 21.2c. per lb.; 52S, 24.2c.; 61S, 22.8c.; 24S, 24.2c.

Flat Sheet: 0.188 in. thickness; 2S and 3S, 22.7c. a lb.; 52S, 26.2c.; 61S, 24.7c.; 24S, 26.7c.

2000-lb. base price for tubing; 30,000-lb. base price for plate, flat stock. Variations from the above gage, size, temper, finish and quantity require extras.

Extruded Shapes: "As extruded" temper; 2000-lb. base price. 2S and 3S, factor No. 1 to 4, 25.5c. per lb.; 14S, factor No. 1 to 4, 35c.; 17S, factor No. 1 to 4, 31c.; 24S, factor No. 1 to 4, 34c.; 53S, factor No. 1 to 4, 28c.; 61S, factor No. 1 to 4, 28 1/2c.

The factor is determined by dividing perimeter of shape by the weight per lineal foot. All prices above are subject to factor number range, temper, length, dimensional tolerances and quantity extras.

Wire, Rod and Bar: Base price; 17ST and 11ST-3, screw machine stock. Rounds: 1/4 in., 28 1/2c. per lb.; 1/2 in., 26c.; 1 in., 24 1/2c.; 2 in., 23c. Hexagonals: 1/4 in., 34 1/2c. per lb.; 1/2 in., 28 1/2c.; 1 in., 25 1/2c.; 2 in., 25 1/2c. 2S, as fabricated, random or standard lengths, 1/4 in., 24c. per lb.; 1/2 in., 25c.; 1 in., 24c.; 2 in., 23c. 24ST, rectangles and squares, random or standard lengths, 0.093-0.187 in.

thick by 1.001-2.000 in. wide, 33c. per lb.; 0.751-1.500 in. thick by 2.001-4.000 in. wide, 29c.; 1.501-2.000 in. thick by 4.001-6.000 in. wide, 27 1/2c.

Variation from the above size, temper, finish and quantity require extras.

## NON-FERROUS SCRAP METAL QUOTATIONS

### Copper, Copper Base Alloy

(Current OPA maximum prices, cents per lb., f.o.b. point of shipment, plus premiums for quantities and special preparation.)

#### Group 1

No. 1 wire, No. 1 heavy copper..	9.75
No. 1 tinned copper wire, No. 1 tinned heavy copper .....	9.75
No. 2 wire, mixed heavy copper.	8.75
Copper tuyeres .....	8.75
Light copper .....	7.75
Copper borings .....	9.75
Lead covered copper wire, cable..	6.00*
Lead covered telephone, power cable .....	6.04
Insulated copper .....	5.10*

#### Group 2

Bell metal .....	15.50
High grade bronze gears .....	13.25
High grade bronze solids .....	11.50*
Low lead bronze borings .....	11.50*
Babbitt lined brass bushings .....	13.00
High lead bronze solids .....	10.00*
High lead bronze borings .....	10.00*
Red trolley wheels .....	10.75
Tinny (phosphor bronze) borings.	10.50
Tinny (phosphor bronze) solids..	10.50
Copper-nickel solids and borings..	9.25
Bronze paper mill wire cloth .....	9.50
Aluminum bronze solids .....	9.00
Soft red brass (No. 1 composition)	9.00
Soft red brass borings (No. 1) ..	9.00
Gilding metal turnings .....	8.50
Unlined standard red car boxes ..	8.25
Lined standard red car boxes ..	7.75
Cocks and faucets .....	7.75
Mixed brass screens .....	7.75
Red brass breakage .....	7.50
Old nickel silver solids, borings ..	6.25
Copper lead solids, borings .....	6.25
Yellow brass castings .....	6.25

#### Group 3

Yellow brass soft sheet clippings.	8.625
Yellow rod brass turnings .....	8.375
Zincy bronze borings .....	8.00
Zincy bronze solids .....	8.00
Fired rifle shells .....	8.25
Brass pipe .....	8.00
Old rolled brass .....	7.75
Admiralty condenser tubes .....	8.00
Muntz metal condenser tubes .....	7.50
Plated brass sheet, pipe reflectors	7.50
Manganese bronze solids .....	7.25 <sup>1</sup>
	6.25 <sup>2</sup>
	6.50 <sup>1</sup>
	5.50 <sup>2</sup>
Manganese bronze borings .....	6.50 <sup>1</sup>

#### Group 4

Automobile radiators .....	7.00
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#### Group 5

Refinery brass .....	5.00*
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\*Price varies with analysis. <sup>1</sup>Lead content 0.00 to 0.40 per cent. <sup>2</sup>Lead content 0.41 to 1.00 per cent.

### MAGNESIUM

Sheet, rod, tubes, bars and extruded shapes are subject to individual quotation. Magnesium Metal Turnings: 100 lb. or more, 46c. a lb.; 25 to 90 lb., 56c.; less than 25 lb., 66c. a lb.

### Aluminum

(Current OPA maximum prices, cents per lb., for less than 1000 lb. lots, f.o.b. point of shipment, plus premiums for quantities and special preparation.)

#### Plant scrap, segregated

2S solids .....	10.00
All other solids .....	9.50
Borings and turnings .....	7.50

#### Plant scrap, mixed

All solids .....	8.50
Borings and turnings .....	6.50

#### Obsolete scrap

Pure cable .....	10.00
Old sheet and utensils .....	8.50
Old castings and forgings .....	9.00
Pistons, free of struts .....	9.00
Pistons, with struts .....	7.00

For lots of 1000 to 19,999 lb., add 1c. to above prices except for old castings and forgings, pistons free of struts and pistons with struts for which there is a premium of 1/2c. a lb. For lots of 20,000 lb. or over add 1 1/2c. a lb. to prices listed above.

### Magnesium

#### Segregated plant scrap

Pure solids and all other solids, exempt	
Borings and turnings .....	8.00

#### Mixed, contaminated plant scrap

Grade 1 solids .....	11.00
Grade 1 borings and turnings .....	7.00
Grade 2 solids .....	9.00
Grade 2 borings and turnings .....	5.00

For lots of 1500 lb. and over add 1c. per lb.

### Zinc

(Current OPA maximum prices, cents per lb., f.o.b., shipping point.)

New zinc clippings, trimmings ..	7.25
Engravers', lithographers' plates..	7.25
Old zinc scrap .....	5.75
Unswaged zinc dross .....	5.80
Die cast slab .....	5.80
New die cast scrap .....	4.95
Radiator grilles, old and new .....	4.95
Old die cast scrap .....	4.50

### Lead

Soft and hard lead, including cable lead, f.o.b. point of shipment, deduct 0.55c. per lb. from basing point prices for refined metal.

### Nickel

Nickel content 98 + per cent, copper under 1/2 per cent, 26c. per lb.; 90 to 98 per cent nickel, 26c. per lb. of contained nickel.

## ELECTROPLATING ANODES AND CHEMICALS

### Anodes

(Cents per lb., f.o.b. shipping point)

Copper: Cast, elliptical, 15 in. and longer .....	25%
Electrolytic, full size, 22 1/2c., cut to size .....	30%
Rolled, oval, straight, 15 in. and longer .....	23 1/4
Curved .....	24 1/4
Brass: Cast, 82-20, elliptical, 15 in. and longer .....	23%
Zinc: Cast, 99.99, 16 in. and over .....	16 1/4
Nickel: 99% plus, cast .....	47
Rolled, depolarized .....	48
Silver: Rolled, 999 fine per Troy (1-9) oz., per oz. ....	58

### Chemicals

(Cents per lb., for quantities, based on delivery from New York City)

Copper cyanide, tech., 100-lb. bbls. ....	34
Copper sulphate, 99.5 crystals, bbls. 1-5 .....	5.65
Nickel salts, single, 425-lb. bbls. ....	13-13.5
Silver cyanide, 100 oz. lots ..	40.82-41 1/4
Sodium cyanide, 96% dom., 100-lb. dms. ....	0.15
Zinc cyanide, 100-lb. dms. ....	33
Zinc sulphate, 89% crystals, bbls. ....	6.8

# SCRAP

... News and Market Activities

## Scrap Troubles Mainly Minor Complaints

• • • Scrap supply and demand across the country seem on the surface to be very comfortable at the moment although many contributory factors have appeared which may at a later date bring about some shortage. Collections for the most part appear to be at a very low stage and most consumers are taking all they can get but not in unlimited quantities. Yards appear to be fairly busy and are shipping all available scrap but the results of slowed collections are beginning to show.

Scrap consumption was reported excessively heavy in the Pittsburgh area, particularly, as a result of a shortage of hot metal caused by blast furnaces being down for repairs augmented by those which were banked for a week during the last coal stoppage. Several individual areas report a complete slowness in the business embracing not only poor collections but poor demand although this is not typical nation-wide.

Scrap quality is the complaint in several areas with over abundance of light scrap and turnings and borings. The latter two grades, by contrast are reported moving well in New England and Buffalo. Both gasoline shortages and labor shortages have proved particularly troublesome to East Coast yards and account somewhat for the poor collections reported. Auto graveyards of the type that normally bought jalopies only for scrapping are having a struggle with the new order calling for the salvaging of all usable parts. The order, while intended to rescue many usable repair parts otherwise being scrapped, may find the demand for parts not equal in value to the tonnage produced by these yards when permitted to operate without this restriction.

Demolition salvage work is still going on and Philadelphia reports the wrecking of nine buildings of the John B. Stetson Co. which will yield about 4000 tons of mainly heavy scrap.

An unconfirmed story going the rounds concerns a government yard rumored to be planned for New England for the processing of battlefield scrap to the exclusion of the yards, some of which are reported to have installed equipment some time ago to do such processing. No confirmation of such a plan by the government has been obtainable and

opinion discredits the story on the basis that the government now realizes the importance of the scrap trade as established and would not enter into a competitive venture.

A second story reports the ultimate elimination of the trade from preparation of ship scrap based on the action of one scrap consuming mill that accepted unprepared ship scrap direct at \$3 per ton less. Again little belief is placed in such a set-up as most mills have neither the room nor the equipment for scrap preparation.

## Scrap Stocks Down Slightly Again in March

• • • Bearing out the remarks of Merrill Stubbs, chief of the Industrial Salvage Section of WPB, the statistics of the Bureau of Mines report that stocks of iron and steel scrap have decreased again in March. Stubbs made this statement in a recent address before the National Steel Warehouse Assn. in New York.

Domestic stocks of iron and steel scrap at all points at the end of March approximated 6,500,000 gross tons, down slightly from the 6,871,000 tons reported at the end of February. This represented a decrease of less than 1 per cent in consumers' stocks while suppliers' and producers' stocks increased slightly. Consumers' stocks at the end of March were 5,517,000 tons compared with 5,554,000 tons at the end of February and suppliers' and producers' stocks were March was 4,787,000 tons compared 1,333,000 tons and 1,327,000 tons, respectively.

PITTSBURGH—Scrap consumption is slightly heavier here recently due to less hot metal being available. This trend is expected to continue. There are no tight spots yet, but some of the optimism over scrap supplies has begun to disappear.

DETROIT—General Motors scrap collections for the first four months of 1943 totaled approximately 230,000 tons, as compared with 200,000 tons in the preceding four months and 143,000 tons a year ago in the same period. Enlarged production of scrap was said to be the principal reason for the increased shipments to mills and smelters, although 20,000 tons of non-production scrap were accumulated during the period.

CINCINNATI—A reluctance on the part of mills to purchase scrap has developed during the last week. Only one district mill continues to accept scrap, but other units in the area are refusing all types of material except, of course, high grade heavy steel. Similarly, the foundries appear to be in fairly comfortable position and here, too, an easing up in the demand for scrap is noted. With dealers experiencing continued difficulty in maintaining even a minimum labor force in yards, they feel that a definite stringency in the scrap market is indicated before the summer is over.

BUFFALO—Despite severe labor shortages, scrap yard operators reported this week that business was continuing at a fairly brisk pace. Turnings are moving better and that problem seems to be solving itself. Leading consumers are now taking turnings in larger quantities. One large buyer reports mill reserves in good shape but complains that quality of scrap is far short of what he would like it to be. Western New York auto graveyard operations virtually have been halted by the order to salvage all usable parts.

BIRMINGHAM—No increase in the demand for steel scrap is noticeable in this district and there is no demand whatsoever for cast grades.

BOSTON—Brokers generally report a "holiday" market. On the other hand, yards, although not soliciting new accounts, are shipping as fast as labor supply admits. Materials enjoying the most stable market are borings and turnings. The latter go to steel mills as do some borings, and borings for gas purifiers move like clockwork. New England steel mills are taking mixed shipyard scrap and doing their own preparing at \$3 a ton less than regularly prepared material costs.

NEW YORK—Mills supplied by this district are still comfortable as far as scrap inventory is concerned. They are accepting limited quantities of scrap while trying to work down surplus stocks. Most of the bans of shipments have been lifted although there are still some mills qualifying their demands.

ST. LOUIS—Receipts of scrap by mills in the St. Louis industrial district were slowed up this week as a result of floods and the shortage of material and labor. Inventories in hands of mills range from 10 to 30 days' supplies. The St. Louis chapter of Scrap Iron and Steel, Inc., has appointed a committee to confer with the WPB to relieve the manpower shortage in the yards, which is serious.

PHILADELPHIA—There has been little change in the movement of scrap this past week. Some mills are accepting what scrap is being shipped but this is still in limited quantities since dealers have little scrap coming into their yards. It is expected by some brokers that there will be a shortage in the next 60 to 90 days when the mills demand greater tonnages.



# SCRAP PRICES

## IRON AND STEEL (OTHER THAN RAILROAD) SCRAP

(All Prices Are Per Gross Ton)

### BASIC OPEN HEARTH GRADES

### BLAST FURNACE GRADES

### ELECTRIC FURNACE, ACID OPEN HEARTH AND FOUNDRY GRADES

Low Ph.s.		Heavy Structural and Plate				Foundry Steel							
Billet, Joorn, Forge Crops	Bar Crops, Punch-ings Plate Scrap and Cast Steel	3 ft. and Under	2 ft. and Under	1 ft. and Under	2 ft. and Under	1 ft. and Under	Auto. Springs, and Crank-shafts	All'y Free Low Phos. and Sulphur Turnings	Heavy Axle and Forge Turn. First Cut	Electric Furnace Bundles			
	\$25.00	\$22.50	\$21.50	\$22.00	\$22.50	\$21.50	\$22.00	\$21.00	\$18.00	\$19.50	\$21.00		
	24.50	22.00	21.00	21.50	22.00	21.00	21.50	20.50	17.50	19.00	20.50		
	23.75	21.25	20.25	20.75	21.25	20.25	20.75	19.75	16.75	18.25	19.75		
	24.50	22.00	21.00	21.50	22.00	21.00	21.50	20.50	17.50	19.00	20.50		
	24.25	21.75	20.75	21.25	21.75	20.75	21.25	20.25	17.25	18.75	20.25		
	23.25	20.75	19.75	20.25	20.75	19.75	20.25	19.25	16.25	17.75	19.25		
	23.00	20.50	19.50	20.00	20.50	19.50	20.00	19.00	16.00	17.50	19.00		
	22.85	20.35	19.35	19.85	20.35	19.35	19.85	18.85	15.85	17.35	18.85		
	22.50	20.00	19.00	19.50	20.00	19.00	19.50	18.50	15.50	17.00	18.50		
22.00	19.50	18.50	19.00	19.50	18.50	19.00	18.00	15.00	16.50	18.00			
21.50	19.00	18.00	18.50	19.00	18.00	18.50	17.50	14.50	16.00	17.50			
19.50	17.00	16.00	16.50	17.00	16.00	16.50	15.00	12.50	14.00	15.50			

<sup>a</sup>Baled turnings are \$5 per gross ton higher.

**BUNDLES:** Tin can bundles are \$4 below dealers' No. 2 bundles. No. 3 bundles are \$2 less than No. 1 heavy melting.

**AT NEW YORK CITY** or Brooklyn, the maximum shipping point price is \$15.33 for No. 1 heavy melting, f.o.b. cars, f.a.s. vessel or loaded on truck. Minimum set at \$14 per gross ton at any shipping point in U. S. Other grades carry differentials similar to those in table. New Jersey prices must be computed on basis of all-rail. At Boston the maximum is \$15.05 for No. 1 f.o.b. cars, f.a.s. vessel or loaded on trucks. Shipments from a New England shipping point to a consumer outside New England carry maximum transportation charge of \$6.66 per ton.

**SWITCHING CHARGES:** Deductions for shipping points within basing points (cents per gross ton) are: Pittsburgh, Brackenridge, 55c.; Midland, Johnstown, Sharon, Youngstown, Warren, Weirton, Cleveland, Toledo, Los Angeles, San Francisco, 42c.; Butler, Monessen, Canton, Steubenville, Cincinnati\*, Portsmouth, Ashland, Coatesville, Harrisburg, Phoenixville, Bethlehem, Kokomo, Duluth, St. Louis, 28c.; Buffalo, Claymont, 36c.; Conshohocken, 11c.; Atlanta, Birmingham, 32c.; Pittsburg, Cal., 42c.; Middletown, 14c.; Sparrows Point, 11c.; Chicago, 84c.; Detroit, 53c.; Alabama City, 26c.; Minnequa, 22c.; Seattle, 38c. \*At Cincinnati, for basic open hearth grades, foundry steel and auto springs and crankshafts, deduct 80c. per ton.

**PITTSBURGH** basing point includes switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport. Cincinnati basing point includes Newport, Ky., switching district. St. Louis includes switching districts of Granite City, East St. Louis, Madison, Ill. San Francisco includes switching districts of S. San Francisco, Niles and Oakmont, Cal. Claymont, Del., includes the switching point of Chester, Pa. Chicago includes Gary, Ind., switching district.

**MAXIMUM SHIPPING POINT PRICE**—Where shipment is by rail or vessel, or by combination of rail and vessel, the scrap is at its shipping point when placed f.o.b. railroad or f.a.s. vessel. In such cases, the maximum shipping point prices shall be: (a) For shipping points located within a basing point, the price listed in the table above

for the scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point and (b) for shipping points located outside the basing point, the price in table above at the most favorable basing point minus the lowest transportation charge by rail or water or combination thereof. In lieu of dock charge add 75c. a ton\*, but 50c. if moved by deck scow or railroad lighter. Shipping by motor vehicle: The scrap is at its shipping point when loaded. For shipping points located within basing points take price listed in table minus applicable switching charge. If located outside a basing point, the price at the most favorable basing point minus lowest established charge for transporting by common carrier. If no established transportation rate exists, the customary costs are deducted. Published dock charges prevail. If unpublished include 75c.\* For exceptions see official order.

**UNPREPARED SCRAP:** For unprepared scrap, maximum prices shall be \$3.50 (and in the case of the material from which No. 1, No. 2, and No. 3 bundles are made \$4) less maximum prices for the corresponding grade or grades of prepared scrap. In no case, however, shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Converter may charge \$2.50 per ton on consumer-owned unprepared remote scrap (see order). A preparation-in-transit charge for allocated unprepared scrap is provided.

**NEW LISTED GRADES:** Priced in dollars per gross ton less than No. 1 heavy melting steel. Pit scrap, ladle skulls, slag reclaim, etc., of 85% or more Fe priced—\$2; 75 to 85% Fe—\$4; under 75% Fe—\$8 per ton. Mill scale of 65% or more Fe—\$8 per ton. Mill cinder and grindings, shipping point maximum price of \$4 per gross ton at all U. S. shipping points.

**CHEMICAL BORINGS:** No. 1 (new, clean, containing not more than 1 per cent oil), \$1 less than No. 1 heavy melting; No. 2 (new, clean, containing not more than 1.5 per cent oil), \$2 less than No. 1 heavy melting. If loaded in box cars add 75c.

\*At Memphis 50c.; Great Lakes ports \$1; New England \$1.25.

### RAILROAD SCRAP

#### Scrap Rails

	No. 1 RR Heavy Melting	Scrap Rails	Rails for Rerolling	3 ft. and Under	2 ft. and Under	18 in. and Under
Cleveland, Cincinnati, Ashland, Portsmouth, Middletown, Canton, Pittsburgh, Sharon, Steubenville, Wheeling, Youngstown, Chicago, Philadelphia, Sparrows Pt., Wilmington, Birmingham, Los Angeles, San Francisco	\$20.50	\$21.50	\$23.00	\$23.50	\$23.75	\$24.00
Buffalo, Detroit, Duluth, Kansas City, Mo., Kokomo, Ind., Seattle, St. Louis	21.00	22.00	23.50	24.00	24.25	24.50
Chicago, Philadelphia, Sparrows Pt., Wilmington, Birmingham, Los Angeles, San Francisco	19.75	20.75	22.25	22.75	23.00	23.25
San Francisco	18.00	19.00	20.50	21.00	21.25	21.50
Buffalo, Detroit, Duluth, Kansas City, Mo., Kokomo, Ind., Seattle, St. Louis	20.25	21.25	22.75	23.25	23.50	23.75
Detroit, Duluth, Kansas City, Mo., Kokomo, Ind., Seattle, St. Louis	18.85	19.85	21.35	21.85	22.10	22.35
Duluth, Kansas City, Mo., Kokomo, Ind., Seattle, St. Louis	19.00	20.00	21.50	22.00	22.25	22.50
Kansas City, Mo., Kokomo, Ind., Seattle, St. Louis	17.00	18.00	19.50	20.00	20.25	20.50
Kokomo, Ind., Seattle, St. Louis	19.25	20.25	21.75	22.25	22.50	22.75
Seattle, St. Louis	15.50	16.50	18.00	18.50	18.75	19.00
St. Louis	18.50	19.50	21.00	21.50	21.75	22.00

### CAST IRON SCRAP

	Group A	Group B	Group C
No. 1 cupola cast	\$18.00	\$19.00	\$20.00
Clean auto cast	18.00	19.00	20.00
Unstripped motor blocks	15.50	16.50	17.50
Stove Plate	17.00	18.00	19.00
Heavy Breakable Cast	15.50	16.50	17.50
Charging Box Size Cast	17.00	18.00	19.00
Misc. Malleable	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C: States not named in A and B: switching district of Kansas City, Kan., Mo.

## Tool Steel Scrap Ceiling Prices Set by MPR 379, May 4, 1943

BASE PRICE SEGREGATED		BASE PRICE UNSEGREGATED SOLIDS		BASE PRICE UNSEGREGATED TURNINGS	
Type	Solids, Lb. Cont. W	Type	Turnings, Lb. Cont. W	Type	Turnings, Lb. Cont. W
Type 1	\$1.80	Type 1	\$1.50 per lb. contained W if 5% or more.	Type 1	\$1.30 per lb. contained W if 5% or more.
Type 2	1.60	Type 2	\$1.15 per lb. contained W if over 1% and less than 5%.	Type 2	\$1.00 per lb. contained W if 1% and less than 5%.
Type 3	1.25	Type 3	\$0.80 per lb. contained Mo if 1½% or more.	Type 3	\$0.70 per lb. contained Mo if 1½% or more.
Type 4*	0.125				
Type 5*	0.135				

\*Per lb. of scrap material.

# Comparison of Prices . . .

Advances Over Past Week in Heavy Type; Declines in Italics.

[Prices Are F.O.B. Major Basing Points]

Flat Rolled Steel:	June 15, 1943	June 8, 1943	May 18, 1943	June 16, 1942
(Cents Per Lb.)				
Hot rolled sheets.....	2.10	2.10	2.10	2.10
Cold rolled sheets.....	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip.....	2.10	2.10	2.10	2.10
Cold rolled strip.....	2.80	2.80	2.80	2.80
Plates.....	2.10	2.10	2.10	2.10
Plates, wrought iron....	3.80	3.80	3.80	3.80
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00

Tin and Terne Plate:	June 15, 1943	June 8, 1943	May 18, 1943	June 16, 1942
(Dollars Per Base Box)				
Tin plate, standard cokes	\$5.00	\$5.00	\$5.00	\$5.00
Tin plate, electrolytic...	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.30	4.30	4.30	4.30

Bars and Shapes:	June 15, 1943	June 8, 1943	May 18, 1943	June 16, 1942
(Cents Per Lb.)				
Merchant bars.....	2.15	2.15	2.15	2.15
Cold finished bars.....	2.65	2.65	2.65	2.65
Alloy bars.....	2.70	2.70	2.70	2.70
Structural shapes.....	2.10	2.10	2.10	2.10
Stainless bars (No. 302).	24.00	24.00	24.00	24.00
Wrought iron bars.....	4.40	4.40	4.40	4.40

Wire and Wire Products:	June 15, 1943	June 8, 1943	May 18, 1943	June 16, 1942
(Cents Per Lb.)				
Plain wire.....	2.60	2.60	2.60	2.60
Wire nails.....	2.55	2.55	2.55	2.55

Rails:	June 15, 1943	June 8, 1943	May 18, 1943	June 16, 1942
(Dollars Per Gross Ton)				
Heavy rails.....	\$40.00	\$40.00	\$40.00	\$40.00
Light rails.....	40.00	40.00	40.00	40.00

Semi-Finished Steel:	June 15, 1943	June 8, 1943	May 18, 1943	June 16, 1942
(Dollars Per Gross Ton)				
Rerolling billets.....	\$34.00	\$34.00	\$34.00	\$34.00
Sheet bars.....	34.00	34.00	34.00	34.00
Slabs.....	34.00	34.00	34.00	34.00
Forging billets.....	40.00	40.00	40.00	40.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00

Wire Rods and Skelp:	June 15, 1943	June 8, 1943	May 18, 1943	June 16, 1942
(Cents Per Lb.)				
Wire rods.....	2.00	2.00	2.00	2.00
Skelp (grvd).....	1.90	1.90	1.90	1.90

Pig Iron:	June 15, 1943	June 8, 1943	May 18, 1943	June 16, 1942
(Per Gross Ton)				
No. 2 fdy., Philadelphia..	\$25.84	\$25.84	\$25.89	\$25.89
No. 2, Valley furnace...	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti...	24.68	24.68	24.68	24.68
No. 2, Birmingham.....	20.38	20.38	20.38	20.38
No. 2, foundry, Chicago†	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa...	25.39	25.39	25.39	25.39
Basic, Valley furnace...	23.50	23.50	23.50	23.50
Malleable, Chicago†....	24.00	24.00	24.00	24.00
Malleable, Valley.....	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago..	31.34	31.34	31.34	31.34
Ferromanganese.....	135.00	135.00	135.00	135.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.  
‡For carlots at seaboard.

Scrap:	June 15, 1943	June 8, 1943	May 18, 1943	June 16, 1942
(Per Gross Ton)				
Heavy melt'g steel, P'gh.	\$20.00	\$20.00	\$20.00	\$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.85	17.85	17.85	17.85
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh...	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia.	20.00	20.00	20.00	20.00
No. 1 cast, Ch'go.....	20.00	20.00	20.00	20.00

Coke, Connellsville:	June 15, 1943	June 8, 1943	May 18, 1943	June 16, 1942
(Per Net Ton at Oven)				
Furnace coke, prompt...	\$6.50	\$6.50	\$6.50	\$6.00
Foundry coke, prompt...	7.50	7.375	6.875	6.875

Non-Ferrous Metals:	June 15, 1943	June 8, 1943	May 18, 1943	June 16, 1942
(Cents per Lb. to Large Buyers)				
Copper, electro., Conn...	12.00	12.00	12.00	12.00
Copper, Lake, New York.	12.00	12.00	12.00	12.00
Tin (Straits), New York.	52.00	52.00	52.00	52.00
Zinc, East St. Louis....	8.25	8.25	8.25	8.25
Lead, St. Louis.....	6.35	6.35	6.35	6.35
Aluminum, Virgin, del'd.	15.00	15.00	15.00	15.00
Nickel, electrolytic.....	35.00	35.00	35.00	35.00
Magnesium, ingot.....	20.50	20.50	20.50	22.50
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 167 and 177.

## Composite Prices . . .

FINISHED STEEL	
June 15, 1943.....	2.25513c. a Lb.....
One week ago.....	2.25513c. a Lb.....
One month ago.....	2.25513c. a Lb.....
One year ago.....	2.26190c. a Lb.....

HIGH		LOW	
1943.....	2.25513c.,	2.25513c.,	
1942.....	2.26190c.,	2.26190c.,	
1941.....	2.43078c.,	2.43078c.,	
1940.....	2.30467c., Jan. 2	2.24107c., Apr. 16	
1939.....	2.35367c., Jan. 3	2.26689c., May 16	
1938.....	2.58414c., Jan. 4	2.27207c., Oct. 18	
1937.....	2.58414c., Mar. 9	2.32263c., Jan. 4	
1936.....	2.32263c., Dec. 28	2.05200c., Mar. 10	
1935.....	2.07642c., Oct. 1	2.06492c., Jan. 8	
1934.....	2.15367c., Apr. 24	1.95757c., Jan. 2	
1933.....	1.95578c., Oct. 3	1.75836c., May 2	
1932.....	1.89196c., July 5	1.83901c., Mar. 1	
1931.....	1.99626c., Jan. 13	1.86586c., Dec. 29	
1930.....	2.25488c., Jan. 7	1.97319c., Dec. 9	
1929.....	2.31773c., May 28	2.26498c., Oct. 29	

Weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 per cent of the United States output. Index recapitulated in Aug. 28, 1941, issue.

PIG IRON	
.....	23.61 a Gross Ton.....
.....	23.61 a Gross Ton.....
.....	23.61 a Gross Ton.....
.....	23.61 a Gross Ton.....

HIGH		LOW	
.....	\$23.61	\$23.61	
.....	23.61	23.61	
.....	\$23.61, Mar. 20	\$23.45, Jan. 2	
.....	23.45, Dec. 23	22.61, Jan. 2	
.....	22.61, Sept. 19	20.61, Sept. 12	
.....	23.25, June 21	19.61, July 6	
.....	23.25, Mar. 9	20.25, Feb. 16	
.....	19.74, Nov. 24	18.73, Aug. 11	
.....	18.84, Nov. 5	17.83, May 14	
.....	17.90, May 1	16.90, Jan. 27	
.....	16.90, Dec. 5	13.56, Jan. 3	
.....	14.81, Jan. 5	13.56, Dec. 6	
.....	15.90, Jan. 6	14.79, Dec. 15	
.....	18.21, Jan. 7	15.90, Dec. 16	
.....	18.71, May 14	18.21, Dec. 17	

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

SCRAP STEEL	
.....	\$19.17 a Gross Ton.....
.....	\$19.17 a Gross Ton.....
.....	\$19.17 a Gross Ton.....
.....	\$19.17 a Gross Ton.....

HIGH		LOW	
.....	\$19.17	\$19.17	
.....	19.17	19.17	
.....	\$22.00, Jan. 7	\$19.17, Apr. 10	
.....	21.83, Dec. 30	16.04, Apr. 9	
.....	22.50, Oct. 3	14.08, May 16	
.....	15.00, Nov. 22	11.00, June 7	
.....	21.92, Mar. 30	12.67, June 9	
.....	17.75, Dec. 21	12.67, June 9	
.....	13.42, Dec. 10	10.33, Apr. 29	
.....	13.00, Mar. 13	9.50, Sept. 25	
.....	12.25, Aug. 8	6.75, Jan. 3	
.....	8.50, Jan. 12	6.43, July 5	
.....	11.33, Jan. 6	8.50, Dec. 29	
.....	15.00, Feb. 18	11.25, Dec. 9	
.....	17.58, Jan. 29	14.08, Dec. 3	

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.





# PRICES

## WAREHOUSE PRICES

(Delivered Metropolitan areas, per 100 lb. These prices do not necessarily apply for dislocated tonnage shipments when the f.o.b. City prices are used in conformance with OPA Schedule 49)

Cities	SHEETS			STRIP		Plates 1/4 in. and heavier	Structural Shapes	BARS		ALLOY BARS			
	Hot Rolled (10 gage)	Cold Rolled	Galvanized (24 gage)	Hot Rolled	Cold Rolled			Hot Rolled	Cold Finished	Hot Rolled, 2300	Hot Rolled, 3100	Cold Drawn, 2300	Cold Drawn, 3100
*Philadelphia	\$3.518	\$4.872 <sup>5</sup>	\$5.018	\$3.922	\$4.772	\$3.605	\$3.666	\$3.822	\$4.072		\$7.116		
*New York	3.590	4.613 <sup>2</sup>	5.010	3.974 <sup>6</sup>	4.774	3.768	3.758	3.853	4.103	6.008	7.158	7.303	8.453
*Boston	3.774	4.744	5.224	4.106	4.715	3.912	3.912	4.044	4.144	6.162	7.312	7.344	8.494
*Baltimore	3.394	4.852	4.894	3.902	4.752	3.594	3.759	3.802	4.052				
*Norfolk	3.771	4.965	5.371	4.165	4.865	3.971	4.002	4.065	4.165				
*Washington	3.596	4.841	5.196	4.041	4.741	3.796	3.930	3.941	4.041				
Pittsburgh	3.35	4.00	4.75	3.60	3.20	3.40	3.40	3.35	3.65	7.45	5.75	8.40	6.75
Chicago	3.25	4.10	4.85 <sup>1</sup>	3.60	3.50	3.55	3.55	3.50	3.75	7.35	5.65	8.40	6.75
Cleveland	3.35	4.05	4.62	3.50	3.20	3.40	3.58	3.25	3.75	7.55	5.85	8.40	6.75
Detroit	3.43	4.30	4.84 <sup>1</sup>	3.43	3.40	3.60	3.65	3.43	3.80	7.67	5.97	8.70	7.05
Buffalo	3.25	4.30 <sup>1</sup>	4.75 <sup>4</sup>	3.82	3.52	3.62	3.40	3.35	3.75	7.35	5.65	8.40	6.75
Birmingham	3.45 <sup>3</sup>	4.75 <sup>1</sup>	4.75 <sup>1</sup>	3.70 <sup>3</sup>		3.55 <sup>3</sup>	3.55 <sup>3</sup>	3.50 <sup>3</sup>	4.43				
St. Louis	3.39	4.24 <sup>2</sup>	4.99 <sup>1</sup>	3.74	3.61	3.69	3.69	3.64	4.02	7.72	6.02	8.77	7.12
St. Paul	3.50	4.35	5.00	3.85	3.83	3.80	3.88	3.75	4.34	7.45	6.00	8.84	7.44
Milwaukee	3.38	4.23 <sup>2</sup>	4.98 <sup>1</sup>	3.73	3.54	3.68	3.68	3.63	3.88	7.58	5.88	8.63	6.98
Cincinnati	3.42	4.37 <sup>2</sup>	4.42 <sup>1</sup>	3.67	3.45	3.65	3.68	3.60	4.00	7.69	5.99	8.50	7.10
Indianapolis	3.45	4.25	5.01 <sup>1</sup>	3.75	3.28	3.70	3.70	3.60	3.97	7.67	5.97	8.72	7.07
Omaha	3.85	4.77	5.52 <sup>1</sup>	4.20		4.15	4.15	4.10	4.42				
Memphis	3.85	4.66	5.25	4.10		3.95	3.95	3.90	4.31				
New Orleans	3.95	4.95	5.25	4.20		3.90	3.90	4.10	4.60				
Houston	3.75	5.43	5.25	4.30		5.25	5.25	3.75	4.50				
Los Angeles	4.95	7.15	5.95	4.90		4.90	4.60	4.35	5.70	9.55	8.55	10.55	9.55
San Francisco	4.55	7.55	6.60	4.50		4.65	4.35	3.95	5.55	9.80	8.80	10.80	9.80
Seattle	4.65 <sup>7</sup>	6.63	5.70 <sup>7</sup>	4.25		4.75	4.45	4.20	5.75		8.00		

## N. E. STEELS

(Hot Rolled Mill Extras for Alloy Content)

Designa- tion	CHEMICAL COMPOSITION LIMITS, PER CENT							Basic Open-Hearth		Electric Furnace			
	Carbon	Man- ganese	Phos- phorus Max.	Sul- phur Max.	Silicon	Chro- mium	Nickel	Molyb- denum	Bars and Strip	Billets, Blooms and Slabs	Bars and Strip	Billets, Blooms and Slabs	
NE 1330	.28/.33	1.60/1.90	.040	.040	.20/.35				.10c	\$2.00			
NE 1335	.33/.38	1.60/1.90	.040	.040	.20/.35				.10	2.00			
NE 1340	.38/.43	1.60/1.90	.040	.040	.20/.35				.10	2.00			
NE 1345	.43/.48	1.60/1.90	.040	.040	.20/.35				.10	2.00			
NE 1350	.48/.53	1.60/1.90	.040	.040	.20/.35				.10	2.00			
NE 8020	.18/.23	1.00/1.30	.040	.040	.20/.35			.10/.20	.45	9.00	.95c	\$19.00	
NE 8442*	.40/.45	1.30/1.60	.040	.040	.20/.35			.30/.40	.90	18.00	1.40	28.00	
NE 8613	.12/.17	.70/.90	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8615	.13/.18	.70/.90	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8617	.15/.20	.70/.90	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8620	.18/.23	.70/.90	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8630	.28/.33	.70/.90	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8635	.33/.38	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8637	.35/.40	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8640	.38/.43	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8642	.40/.45	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8645	.43/.48	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8650	.48/.53	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8720	.18/.23	.70/.90	.040	.040	.20/.35	.40/.60	.40/.70	.20/.30	.80	16.00	1.30	26.00	
NE 9255	.50/.60	.70/.95	.040	.040	1.80/2.20				.40c	8.00			
NE 9260	.55/.65	.75/1.00	.040	.040	1.80/2.20				.40	8.00			
NE 9262	.55/.65	.75/1.00	.040	.040	1.80/2.20	.20/.40			.65	13.00			
NE 9415	.13/.18	.80/1.10	.040	.040	.40/.60	.20/.40	.20/.50	.08/.15	.80	16.00	1.30c	\$26.00	
NE 9420	.18/.23	.80/1.10	.040	.040	.40/.60	.20/.40	.20/.50	.08/.15	.80	16.00	1.30	26.00	
NE 9422	.20/.25	.80/1.10	.040	.040	.40/.60	.20/.40	.20/.50	.08/.15	.80	16.00	1.30	26.00	
NE 9430	.28/.33	.90/1.20	.040	.040	.40/.60	.20/.40	.20/.50	.08/.15	.80	16.00	1.30	26.00	
NE 9435	.33/.38	.90/1.20	.040	.040	.40/.60	.20/.40	.20/.50	.08/.15	.80	16.00	1.30	26.00	
NE 9437	.35/.40	.90/1.20	.040	.040	.40/.60	.20/.40	.20/.50	.08/.15	.80	16.00	1.30	26.00	
NE 9440	.38/.43	.90/1.20	.040	.040	.40/.60	.20/.40	.20/.50	.08/.15	.80	16.00	1.30	26.00	
NE 9442	.40/.45	1.00/1.30	.040	.040	.40/.60	.20/.40	.20/.50	.08/.15	.85	17.00	1.35	27.00	
NE 9445	.43/.48	1.00/1.30	.040	.040	.40/.60	.20/.40	.20/.50	.08/.15	.85	17.00	1.35	27.00	
NE 9450	.48/.53	1.20/1.50	.040	.040	.40/.60	.20/.40	.20/.50	.08/.15	.85	17.00	1.35	27.00	
NE 9537*	.35/.40	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.70	.15/.25	1.20	24.00	1.70	34.00	
NE 9540*	.38/.43	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.70	.15/.25	1.20	24.00	1.70	34.00	
NE 9542*	.40/.45	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.70	.15/.25	1.20	24.00	1.70	34.00	
NE 9550*	.48/.53	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.70	.15/.25	1.20	24.00	1.70	34.00	
NE 9630	.28/.33	1.20/1.50	.040	.040	.40/.60	.40/.60			.80	16.00	1.30	26.00	
NE 9635	.33/.38	1.20/1.50	.040	.040	.40/.60	.40/.60			.80	16.00	1.30	26.00	
NE 9637	.35/.40	1.20/1.50	.040	.040	.40/.60	.40/.60			.80	16.00	1.30	26.00	
NE 9640	.38/.43	1.20/1.50	.040	.040	.40/.60	.40/.60			.80	16.00	1.30	26.00	
NE 9642	.40/.45	1.30/1.60	.040	.040	.40/.60	.40/.60			.85	17.00	1.35	27.00	
NE 9645	.43/.48	1.30/1.60	.040	.040	.40/.60	.40/.60			.85	17.00	1.35	27.00	
NE 9650	.48/.53	1.20/1.60	.040	.040	.40/.60	.40/.60			.85	17.00	1.35	27.00	

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb.; galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over: Ex-ceptions: <sup>1</sup>500 to 1499 lb. <sup>2</sup>400 to 1499 lb. <sup>3</sup>400 to 3999 lb. <sup>4</sup>450 to 1499 lb. <sup>5</sup>1000 to 1999 lb. <sup>6</sup>0 to 1999 lb. <sup>7</sup>300 to 10,000 lb. At Philadelphia galvanized sheets, 2500 more bundles; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; San Francisco, hot rolled sheets, 400 to 39,999 lb.; galvanized and cold rolled sheets, 750 to 4999 lb.; cold fin. bars, 0-299 lb.; hot rolled alloy bars, 0-4999 lb.; Seattle, cold finished bars, 1000 lb. and over, hot rolled alloy bars, 0-1999 lb.; Memphis, hot rolled sheets, 400 to 1999 lb., galvanized sheets, 150 and over; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, hot rolled sheets, bars, plates, cold rolled sheets, 300 to 1999 lb.; galvanized sheets, 1 to 6 bundles; cold finished bars, 1 to 99 lbs.; SAE bars, 100 lb. Extras for size, quality, etc., apply on above quotations.

† Los Angeles, San Francisco and Seattle prices reflect special provisions of amendment No. 2 to OPA Price Schedule No. 49.

†† For zoned cities these grades have been revised to NE 8617-20.

\* Base delivered prices according to price zones established by Amendment 14 to RPS 49 including the 3% transportation tax—not in-cluding the 6% freight increase of March 18, 1942, rescinded May 15, 1943.

‡ For zoned cities these grades have been revised to NE 9442-45 Ann'd.

\*Recommended for large sections only. Note: The extras shown above are in addition to a base price of \$2.70c. per 100 lb., on finished products and \$54 per gross ton on semi-finished steel major basing points and are in cents per 100 lb. and dollars per gross ton in semi-finished. When acid open-hearth is specified and acceptable add to basic open hearth alloy differential 0.25c. per lb. for bars and bar strip, \$5.00 per gross ton for billets, blooms and slabs. The ranges shown above are restricted to sizes 100 sq. in. or less or equivalent cross sectional area 18 in. wide or under with a max. individual piece weight of 7000 lb.



## PRICES

### SEMI-FINISHED STEEL

#### Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are \$2.00 higher; f.o.b. Duluth, billets only, \$2 higher. Delivered prices do not reflect new per cent tax on freight rates.

	Per Gross Ton
Rerolling .....	\$34.00
Forging quality .....	40.00
Alloy Steel: Pittsburgh, Chicago, Canton, Massillon, Buffalo, or Bethlehem, per gross ton .....	\$54.00

#### Shell Steel

	Per Gross Ton
3 in. to 12 in. ....	\$52.00
12 in. to 18 in. ....	54.00
18 in. and over .....	56.00
Basic open hearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham. Prices delivered Detroit are \$2.00 higher.	

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

#### Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer .....	\$34.00

#### Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared ...	1.90c.

#### Wire Rods

(No. 5 to 9/32 in.)

	Per Lb.
Pittsburgh, Chicago, Cleveland ...	2.00c.
Worcester, Mass. ....	2.10c.
Birmingham .....	2.00c.
San Francisco .....	2.50c.
Galveston .....	2.25c.

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

### TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse)

	Base per lb.
High speed .....	67c.
Straight molybdenum .....	54c.
Tungsten-molybdenum .....	57 1/2c.
High-carbon-chromium .....	43c.
Oil hardening .....	24c.
Special carbon .....	22c.
Extra carbon .....	18c.
Regular carbon .....	14c.

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi, 3c. higher.

### CORROSION AND HEAT-RESISTING STEEL

(Per lb. base price, f.o.b. Pittsburgh)

#### Chromium-Nickel Alloys

	No. 304	No. 202
Forging billets .....	21.25c.	20.40c.
Bars .....	25.00c.	24.00c.
Plates .....	29.00c.	27.00c.
Structural shapes .....	25.00c.	24.00c.
Sheets .....	36.00c.	34.00c.
Hot rolled strip .....	23.50c.	21.50c.
Cold rolled strip .....	30.00c.	28.00c.
Drawn wire .....	25.00c.	24.00c.

#### Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 446
F. Billets .....	15.725c.	16.15c.	19.125c.	23.375c.
Bars .....	18.50c.	19.00c.	22.50c.	27.50c.
Plates .....	21.50c.	22.00c.	25.50c.	30.50c.
Sheets .....	26.50c.	29.00c.	32.50c.	36.50c.
Hotstrip .....	17.00c.	17.50c.	24.00c.	35.00c.
Cold st. ....	22.00c.	22.50c.	32.00c.	52.00c.

#### Chromium-Nickel Clad Steel (20%)

	No. 304
Plates .....	18.90c.*
Sheets .....	19.00c.

\*Includes annealing and pickling.



The pace of production

is more efficiently governed when the flow of  
supplies to and from storage is

regulated by

# TOWMOTOR



THE 24-HOUR ONE-MAN-GANG

TOWMOTOR CORPORATION • 1230 E. 152ND STREET, CLEVELAND

STRAIGHT-GAS POWERED INDUSTRIAL TRUCKS EXCLUSIVELY—SINCE 1919

THE IRON AGE, June 17, 1943—171

# Acme-Gridley Automatics MOVE INTO THE PRODUCTION BATTLE



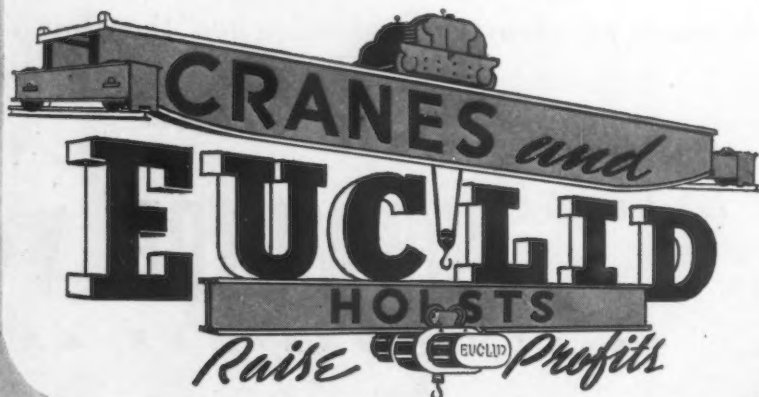
Acme-Gridley Automatics are fighting on every production front—turning out vast quantities of vital metal parts—with characteristic accuracy, speed and economy. Handling these indispensable production units in connection with machining, assembling and shipping operations are nine Euclid Cranes.

These cranes were selected largely because of long demonstrated reliability, convenient floor control and high headroom clearance that permits high piling of heavy parts. They operate almost continuously 24 hours a day, 6 days a week.

The basic aim in designing Euclid Cranes, and Hoists, too, has always been to embody features that assure long, trouble-free service with minimum attention and upkeep cost. That they measure up to this standard is indicated by the discriminating type of purchasers—many of whom have reordered Euclid equipment each time a new demand has developed.

## THE EUCLID CRANE & HOIST CO.

1361 CHARDON RD., EUCLID, O.



## PRICES

### BOLTS, NUTS, RIVETS, SET SCREWS

#### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

#### Machine and Carriage Bolts:

	Per Cent Off List
1/2 in. & smaller x 6 in. & shorter	65 1/2
9/16 & 5/8 in. x 6 in. & shorter	63 1/2
3/4 to 1 in. x 6 in. & shorter	61
1 1/4 in. and larger, all length	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

#### Nuts, Cold Punched or Hot Pressed:

(Hexagon or Square)

1/2 in. and smaller	62
9/16 to 1 in. inclusive	59
1 1/4 to 1 1/2 in. inclusive	57
1 1/2 in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts	U.S.S.	S.A.E.
7/16 in. and smaller	64	64
1/2 in. and smaller	62	62
3/4 in. through 1 in.	60	60
9/16 to 1 in.	59	59
1 1/4 in. through 1 1/2 in.	57	58
1 1/2 in. and larger	56	56

In full container lots, 10 per cent additional discount.

#### Stove Bolts

Packages, nuts loose	71 and 10
In packages, with nuts attached	71
In bulk	80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York on lots of 200 lb. or over.

#### Large Rivets (1/2 in. and larger)

Base per 100 lb.

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$3.75
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#### Small Rivets (7/16 in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 5
---	----------

#### Cap and Set Screws

Per Cent Off List

Upset full fin. hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	64
Upset set screws, cup and oval points	71
Milled studs	46
Flat head cap screws, listed sizes	36
Fillister head cap, listed sizes	51

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

### RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb., gross ton	\$40.00
Angle bars, 100 lb.	2.70
(F.o.b. Basing Points)	Per Gross Ton
Light rails (from billets)	\$40.00
Light rails (from rail steel)	39.00

Base per Lb.

Cut spikes	3.00c.
Screw spikes	5.15c.
Tie plates, steel	2.15c.
Tie plates, pacific Coast	2.30c.
Track bolts	4.75c.
Track bolts, heat treated, to rail-roads	5.00c.
Track bolts, jobbers discount	63-5

Basing Points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond.

### ROOFING TERNE PLATE

(F.o.b. Pittsburgh, 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	\$6.00	\$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00



## PRICES

### ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh) Per Lb.

Field grade	3.20c.
Armature	2.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.15c.

F.o.b. Granite City, add 10c. per 100 lb. on field grade to and including dynamo. Pacific ports add 75c. per 100 lb. on all grades.

### WIRE PRODUCTS

To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham

	Base per Keg
Standard wire nails	\$2.55
Coated nails	2.55
Cutnails, carloads	3.85
	Base per 100 Lb.
Annealed fence wire	\$3.05
Annealed galvanized fence wire	3.10
	Base Column
Woven wire fence*	67
Fence posts (carloads)	69
Single loop bale ties	59
Galvanized barbed wire	70
Twisted barbed wire	70

\*15½ gage and heavier. †On \$0-rod spools in carload quantities.

### WELDED PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought pipe) Base Price—\$200 per Net Ton

#### Steel (Butt Weld)

	Black	Galv.
½ in.	63½	51
¾ in.	66½	55
1 to 3 in.	68½	57½

#### Wrought Iron (Butt Weld)

½ in.	25	3½*
¾ in.	30	10
1 and 1¼ in.	34	16
1½ in.	38	18½
2 in.	37½	18

#### Steel (Lap Weld)

2 in.	61	49½
2½ and 3 in.	64	52½
3½ to 6 in.	66	54½

#### Wrought Iron (Lap Weld)

2 in.	30½	12
2½ to 3½ in.	31½	14½
4 in.	33½	18
4½ to 8 in.	32½	17

#### Steel (Butt, extra strong, plain ends)

	Black	Galv.
½ in.	61½	50½
¾ in.	65½	54½
1 to 3 in.	67	57

#### Wrought Iron (Same as Above)

½ in.	25	6
¾ in.	31	12
1 to 2 in.	38	19½

#### Steel (Lap, extra strong, plain ends)

2 in.	59	48½
2½ and 3 in.	63	52½
3½ to 6 in.	66½	56

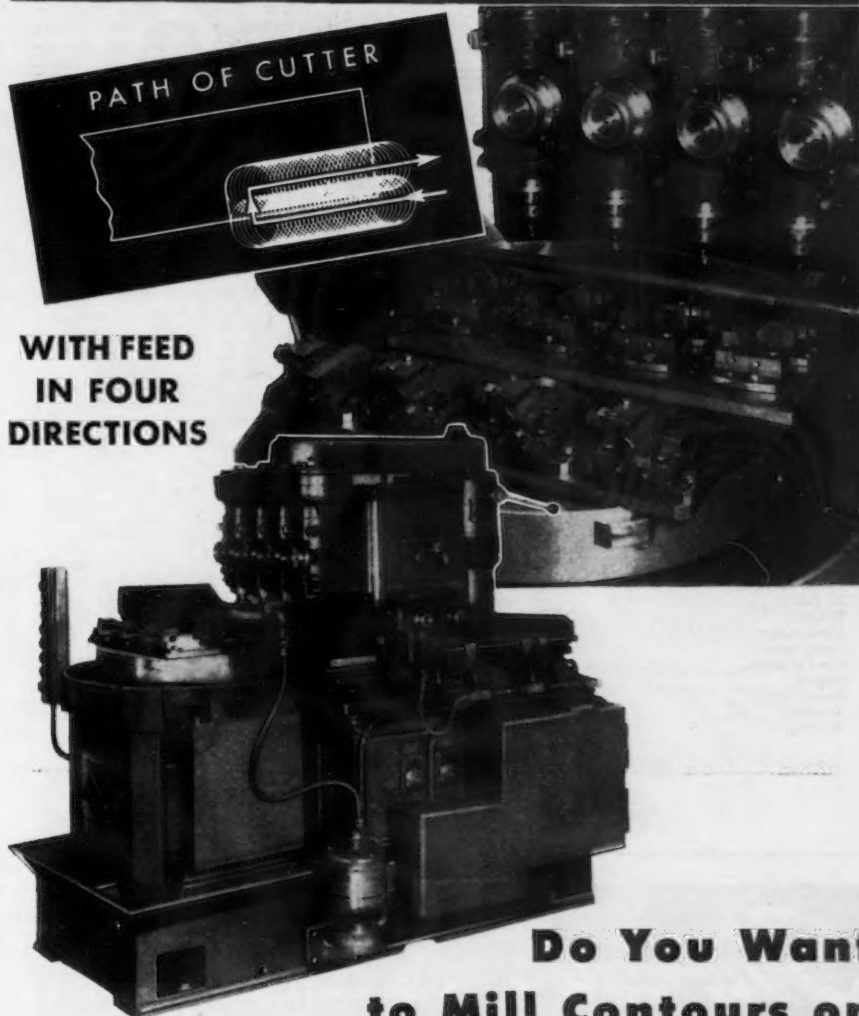
#### Wrought Iron (Same as Above)

2 in.	33½	15½
2½ to 4 in.	39	22½
4½ to 6 in.	37½	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher on all butt weld.

## AUTOMATIC MILLING FOR PRODUCTION



## Do You Want to Mill Contours on Many Small Parts at One Time?

The four-spindle machine shown here was one of several engineered and built by LeMaire to perform milling operations usually done on profilers, which provide a tracer roller for following model. It was developed to mill the recess for carbide inserts in tool bits, embodying a principle which was incorporated in scores of other machines to meet various specific requirements—all in small arms and aircraft milling—and all showing great increases in production over former methods. Some of the machines are milling slots in rear of carbine barrel in trigger housing, a number are milling bosses on aircraft cylinders.

The cooling fins surrounding the bosses prevent cutter from running through to clear the work. The combined use of hydraulics and profile cams makes possible the milling of odd-shaped contours in small parts with the added advantage of full automatic feeds. Since each job presents its own unique problems, LeMaire engineers suggest you send them your blue prints for analysis and solution.

**LeMaire TOOL AND MFG. CO.**  
2661 TELEGRAPH ROAD  
DEARBORN, MICHIGAN  
ENGINEERS AND BUILDERS OF PRODUCTION MACHINES

# PRICES

## PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices (in italics) are delivered quotations per gross ton computed on the basis of the official maxima. Delivered prices do not reflect 3 per cent tax on freight rates.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phosphorus	Charcoal
Boston††	\$25.00	\$24.50	\$26.00	\$26.50		
Brooklyn	27.50			28.00		
Jersey City	26.53	26.03	27.53	27.03		
Philadelphia	25.84	25.34	26.84	26.34	\$30.74	
Bethlehem, Pa.	25.00	24.50	26.00	25.50		
Everett, Mass.††	25.00	24.50	26.00	25.50		
Swedeland, Pa.	25.00	24.50	26.00	25.50		
Steelton, Pa.	25.00	24.50	26.00	25.50	29.50	
Birdsboro, Pa.	25.00	24.50	26.00	25.50	29.50	
Sparrows Point, Md.	25.00	24.50	26.00	25.50		
Erie, Pa.	24.00	23.50	25.00	24.50		
Neville Island, Pa.	24.00	23.50	24.50	24.00		
Sharpsville, Pa.*	24.00	23.50	24.50	24.00		
Buffalo	24.00	23.00	25.00	24.50	29.50	
Cincinnati, Ohio	23.94	23.94		25.11		
Canton, Ohio	25.39	24.89	25.89	25.39	32.69	
Mansfield, Ohio	25.94	25.44	26.44	25.94	32.86	
St. Louis	24.50	24.50				
Chicago	24.00	23.50	24.50	24.00	35.46	\$31.34
Granite City, Ill.	24.00	23.50	24.50	24.00		
Cleveland	24.00	23.50	24.50	24.00	22.42	
Hamilton, Ohio	24.00	23.50	24.50	24.00		
Toledo	24.00	23.50	24.50	24.00		
Youngstown*	24.00	23.50	24.50	24.00	22.42	
Detroit	24.00	23.50	24.50	24.00		
Lake Superior fc.						\$28.00
Lyles, Tenn. fc.†						33.00
St. Paul	26.76		27.26	26.76	39.80	
Duluth	24.50	24.00	25.00	24.50		
Birmingham	20.38	19.00	25.00			
Los Angeles	26.95					
San Francisco	26.95					
Seattle	26.95					
Provo, Utah	22.00	21.50				
Montreal	27.50	27.50		28.00		
Toronto	25.50	25.50		26.00		

GRAY FORGE IRON: Valley or Pittsburgh furnace ..... \$23.50

\*Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

\*\*Pittsburgh Ferromanganese Co. (Chester furnace only) may charge \$2.25 a ton over maximum basing point prices.

†Price shown is for low-phosphorous iron; high-phosphorous sells for \$28.50 at the furnace.

††Eastern Gas & Fuel Associates, Boston, is permitted to sell pig iron produced by its selling company, Mystic Iron Works, Everett, Mass., at \$1 per gross ton above maximum prices.

Delta Chemical & Iron Co., Chicago, may charge \$30 for charcoal iron at its Delta, Mich., furnace.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade which is 1.75 per cent to 2.25 per cent); phosphorous differentials, a reduction of 38c. per ton for phosphorous content of 0.70 per cent and over; manganese differentials, a charge not to exceed 50c. per ton for each 0.50 per cent manganese content in excess of 1.00 per cent. Effective March 3, 1943, \$2 per ton extra may be charged for 0.5 to 0.75 per cent nickel content and \$1 per ton extra for each additional 0.25 per cent nickel.

## Powdered Metals

Prices are based on current market prices of ingots plus a fixed figure. For ton lots f.o.b. shipping point, in cents per lb.

Copper, electrolytic, 150 and 200 mesh	21½ to 23¼c.
Copper, reduced, 150 and 200 mesh	20½ to 25¼c.
Iron, commercial, 100 and 200 mesh	13½ to 15c.
Iron, crushed, 200 mesh and finer	4c.
Iron, hydrogen reduced, 300 mesh and finer	3c.
Iron, electrolytic, unannealed, coarser than 300 mesh	30 to 33c.
Iron, electrolytic, annealed minus 100 mesh	42c.
Iron, carbonyl, 300 mesh and finer	90c.
Aluminum, 100 and 200 mesh	*23 to 27c.
Antimony, 100 mesh	20.6c.
Cadmium, 100 mesh	\$1
Chromium, 150 mesh	\$1.03
Lead, 100, 200 & 300 mesh, 11½ to 12½c.	
Manganese, 150 mesh	51c.
Nickel, 150 mesh	51¼c.
Solder powder, 100 mesh, 8¼c. plus metal	
Tin, 100 mesh	58¾c.

\*Freight allowed east of Mississippi.

## BOILER TUBES

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall. Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots.

	Seamless	Lap Weld
	Cold Drawn	Hot Rolled
2 in. o.d. 13 B.W.G.	15.03	13.04
2½ in. o.d. 12 B.W.G.	20.21	17.54
3 in. o.d. 12 B.W.G.	22.48	19.50
3½ in. o.d. 11 B.W.G.	28.37	24.62
4 in. o.d. 10 B.W.G.	35.20	30.54

(Extras for less carload quantities)

40,000 lb. or ft. and over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	85%

*Strength* you can rely on  
in "SAE 1035's heat treated"



... by Cleveland ("C")  
... by The Kaufman Process

Cleveland Brand hexagon head cap screws made from SAE 1035 steel, heat treated, are worthy of your investigation. Much stronger than ordinary screws, they cost no more—in all popular sizes, fine or coarse thread.

THE CLEVELAND CAP SCREW CO.  
2917 East 79th Street Cleveland, Ohio



## Cleveland Cap Screws

Set Screws and Special Upset Parts

Made by the Originators of the Kaufman Process for Greater Strength and Accuracy  
Specialists for 26 years in Headed and Threaded Products

WAREHOUSES  
CHICAGO: 726 W. Washington Blvd.  
PHILADELPHIA: 12th & Olive Sts.  
NEW YORK: 47 Murray St.  
LOS ANGELES: 1015 E. 16th St.



## PRICES

### CAST IRON WATER PIPE

	Per Net Ton
6-in. and larger, del'd Chicago.....	\$54.80
6-in. and larger, del'd New York....	52.20
6-in. and larger, Birmingham .....	46.00
6-in. and larger f.o.b. cars, San Francisco or Los Angeles.....	69.40
6-in. and larger f.o.b. cars, Seattle.	71.20

Class "A" and gas pipe, \$3 extra; 4-in. pipe is \$3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger is \$45 at Birmingham and \$53.80 delivered Chicago, \$59.40 at San Francisco and Los Angeles, and \$70.20 at Seattle. Delivered prices do not reflect new 3 per cent tax on freight rates.

### LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports\*)

	Per Gross Ton
Old range, bessemer, 51.50 .....	\$4.75
Old range, non-bessemer, 51.50 .....	4.60
Mesaba, bessemer, 51.50 .....	4.60
Mesaba, non-bessemer, 51.50 .....	4.45
High phosphorous, 51.50 .....	4.35

\*Adjustments are made to indicated prices based on variance of Fe content of ores as analyzed on a dry basis by independent laboratories.

### COKE

#### Furnace

	Per Net Ton
†Connellsville, prompt .....	\$6.50*

#### Foundry

†Connellsville, prompt .....	\$7.50
Fayette County, W. Va. (Beehive) ..	\$8.10
By-product, Chicago .....	\$12.25
By-product, New England .....	\$13.75
By-product, Newark .....	\$12.40 to \$12.95
By-product, Philadelphia .....	\$12.38
By-product, Cleveland .....	\$12.30
By-product, Cincinnati .....	\$11.75
By-product, Birmingham .....	\$8.50†
By-product, St. Louis .....	\$12.02
By-product, Buffalo .....	\$12.50

Maximum by-product coke prices established by OPA became effective Oct. 1, 1941.

\*Hand-drawn ovens using trucked coal are permitted to charge \$7.00 per net ton, plus usual transportation. Maximum beehive furnace coke prices established by OPA, Feb. 8, 1942. †F.o.b. oven.

### FLUORSPAR

	Per Net Ton
Domestic washed gravel, 85-5 f.o.b. Kentucky and Illinois mines, all rail .....	\$25.00
Domestic, f.o.b. Ohio River landing barges .....	25.00
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines .....	25.00

### REFRACTORIES

(F.o.b. Works)

#### Fire Clay Brick

	Per 1000
Super-duty brick, St. Louis .....	\$64.60
First quality, Pa., Md., Ky., Mo., Ill. ..	51.30
First quality, New Jersey .....	56.00
Sec. quality, Pa., Md., Ky., Mo., Ill. ..	46.55
Second quality, New Jersey .....	51.00
No. 1, Ohio .....	43.00
Ground fire clay, net ton .....	7.60

#### Silica Brick

Pennsylvania & Birmingham .....	\$51.30
Chicago District .....	58.90
Silica cement, net ton (Eastern) ..	9.00

#### Chrome Brick

	Per Net Ton
Standard, chemically bonded, Balt., Plymouth Meeting, Chester .....	\$54.00

#### Magnesite Brick

Standard, Balt. and Chester .....	\$76.00
Chemically bonded, Baltimore .....	65.00

#### Grain Magnesite

Domestic, f.o.b. Balt. and Chester in sacks (carloads) .....	\$44.00
Domestic, f.o.b. Chewelah, Wash. (in bulk) .....	22.00



No. 100 Decimal Timer

Graduated in decimal hundredths of a minute; sweep hand making complete revolution in one minute; total registration 30 minutes; "start-stop-and-fly-back" operation.



No. 105 Fifth Second Timer

Graduated in seconds and fifth seconds; sweep hand making complete revolution in one minute; total registration 30 minutes; "start-stop-and-fly-back" operation.

## STOP WATCHES Available for Delivery

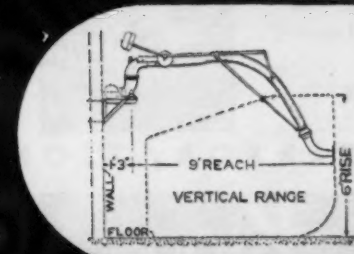
These instruments, produced in one of America's finest plants, contain a high precision, continuous running movement of seven jewels, encased in nickel.

We maintain a complete shop with skilled technicians for quick repairs on all types of stop watches, chronographs and other technical instruments.

### M. J. STILLMAN CO., INC.

116 South Michigan Avenue

Chicago, Illinois



#### COLLECTS WELDING FUMES AT THE SOURCE

—The Ruemelin Fume Collector is the modern way to remove fumes, gases and smoke from arc welding operations. Reduces fatigue. Built in 3', 9' and 15' sizes. Hundreds in operation. Write for your copy of Bulletin No. 37-C.

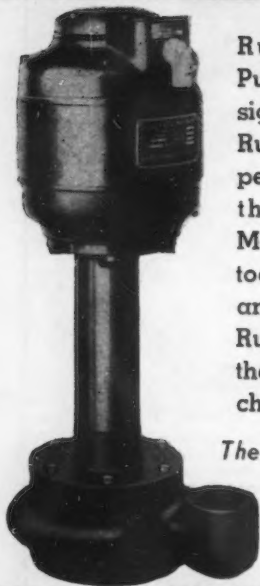
Also, manufacturers of dust control equipment, sand blast machinery, sand blast cabinets, abrasive handling systems.

Ruemelin Mfg. Co., 3870 N. Palmer St., Milwaukee, Wis.

## RUEMELIN FUME COLLECTOR

A 3888-1/2

# RUTHMAN



Ruthman Gusher Coolant Pumps are most efficiently designed. This is why today Ruthman pumps are so dependable and stand up under the most grueling usage. Many well known machine tool manufacturers know this and for this reason use Ruthman on their machines thereby making a good machine even better.

The

**RUTHMAN**  
MACHINERY COMPANY  
CINCINNATI, OHIO



## Coolant PUMPS

### PERFORATED METALS

#### INDUSTRIAL and ORNAMENTAL

To produce the highest quality of perforated metal as used in the industrial arts and for ornamentation has been the ambition and persistent endeavor of this company. The highest quality best serves the user. We are here to serve you.

ANY METAL • ANY PERFORATION

The  
**Harrington & King**  
PERFORATING CO.

5657 FILLMORE STREET—CHICAGO, ILL.

New York Office, 114 Liberty Street

### FERROALLOY

#### Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans, duty paid, 80%, per gross ton (carloads) .....\$135.00  
Delivered Pittsburgh .....\$140.33  
F.o.b. Southern furnaces .....\$135.00

For packed carloads, add \$6 per gross ton; \$10 for ton; \$13.50 for less than a ton; \$18 for less than 200 lb.

#### Electrolytic Manganese

99.9 1/4 + %, less ton lots, per lb. .... 42c.  
Ton lots ..... 40c.  
Annual contracts ..... 38c.

#### Spiegeleisen

(Carlots, per gross ton, Palmerton, Pa.)  
Domestic, 19 to 21% .....\$36.00  
Domestic, 26 to 29% ..... 49.50

#### Electric Ferrosilicon

(Per Gross Ton, Delivered Lump Size)  
50% (carload lots, bulk) .....\$74.50  
50% (ton lots, packed) ..... 87.00  
75% (carload lots, bulk) .....135.00  
75% (ton lots, packed) .....151.00

#### Silvery Iron

(Per Gross Ton, base 6.00 to 6.50 Si)  
F.o.b. Jackson, Ohio .....\$29.50\*  
Buffalo ..... 30.75\*  
For each additional 0.50% silicon add \$1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add \$1 a ton for 0.75% phosphorus or over.  
\*Official OPA price established June 24, 1941.

#### Bessemer Ferrosilicon

Prices are \$1 a ton above Silvery Iron quotations of comparable analysis.

#### Ferrochrome

(66% to 72%, delivered lump size, on contract, per lb. contained Cr)

	Carlots	Ton Lots
4 to 6 carbon	13.00c.	13.75c.
2 carbon	19.50c.	20.25c.
1 carbon	20.50c.	21.25c.
0.10 carbon	22.50c.	23.25c.
0.06 carbon	23.00c.	23.75c.

Spot prices are 1/4c. per lb. of contained chromium higher.

#### Silicon Metal

Contract basis, f.o.b. producer's plant, freight allowed, 1 per cent iron, carlots, per lb. ....14.50c.  
Less-ton lots .....15.25c.  
2% iron, carlots .....13.00c.  
Less-ton lots .....13.75c.

#### Silicon Briquets

Contract basis, carlots, bulk freight allowed, per ton .....\$74.50  
Packed .....\$80.50  
Ton lots .....\$84.50

#### Silicomanganese

(Per gross ton, delivered, carloads, bulk)  
3.00 carbon .....\$120.00\*  
2.50 carbon ..... 125.00\*  
2.00 carbon ..... 130.00\*  
1.00 carbon ..... 140.00\*  
Briquets, contract, basis carlots, bulk freight allowed, per lb. .... 5.80c.†  
Packed ..... 6.05c.†  
Less-ton lots ..... 6.55c.†

\*Spot prices are \$5 per ton higher.  
†Spot prices 1/4c. higher.



## PRICES

### Other Ferroalloys

Ferrotungsten, delivered, carlots, per lb. contained tungsten ...	\$1.90
Tungsten metal powder, 98%-99%, any quantity, per lb. ....	\$2.60
Ferrovanadium, 35%-40%, contract basis, f.o.b. producers plant, usual freight allowances, open-hearth grade, per lb. contained vanadium .....	\$2.70
Special grade .....	\$2.80
Very special grade .....	\$2.90
Vanadium pentoxide, 88%-92% V <sub>2</sub> O <sub>5</sub> technical grade, contract basis, any quantity, per lb. contained V <sub>2</sub> O <sub>5</sub> .....	\$1.10
Ferrobaboron, contract basis, 17.50% boron minimum, f.o.b. Niagara Falls, carlots, per lb. alloy Ton lots .....	\$1.20 \$1.25
Sileaz No. 3, contract basis, f.o.b. Niagara Falls, all quantities, per lb. of alloy .....	23c.
Silvaz No. 3, contract basis, f.o.b. Niagara Falls, all quantities, per lb. of alloy .....	40c.
Grainal, f.o.b. Bridgeville, Pa., freight allowed 100 lb. and over, maximum based on rate to St. Louis, per lb. ....	45c.
Bortam, f.o.b. Niagara Falls Ton lots, per lb. ....	45c.
Less ton lots, per lb. ....	50c.
Borosil, 3% to 4% boron, 40 to 45% silicon, f.o.b. Philo, Ohio, per pound contained boron ....	\$7.00
Ferrocolumbium, 50% to 60%, f.o.b. Niagara Falls, ton lots, per lb. contained columbium ..	\$2.25
Less-ton lots .....	\$2.30
Ferrotitanium, 40%-45%, f.o.b. Niagara Falls, N. Y., ton lots, per lb. contained titanium ....	\$1.23
Less-ton lots .....	\$1.25
Ferrotitanium, 20%-25%; 0.10 C max., ton lots, per lb. contained titanium .....	\$1.35
Less-ton lots .....	\$1.40
High-carbon ferrotitanium, 15%-20%, 6%-8% carbon, contract basis, f.o.b. Niagara Falls, N. Y., freight allowed East of Mississippi River, North of Baltimore & St. Louis, per gross ton.	\$142.50
3%-5% carbon .....	\$157.50
Ferrophosphorus, 18% electric or blast furnace, f.o.b. Anniston, Ala. carlots, with \$3 unitage freight equalized with Rockdale, Tenn., per gross ton .....	\$58.50
Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., \$3 unitage freight equalized with Nashville, per gross ton .....	\$75.00
Ferromolybdenum, 55-75 per cent, f.o.b. Langeloth and Washington, Pa., any quantity, per lb. contained molybdenum .....	95c.
Calcium molybdate, 40%-45%, contract basis, f.o.b. Langeloth and Washington, Pa., any quantity, per lb. contained molybdenum .....	80c.
Molybdenum oxide briquettes, 48%-52% Mo, f.o.b. Langeloth, Pa., per lb. contained Mo .....	80c.
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per lb. contained Mo .....	80c.
Molybdenum powder, 99%, in 200-lb. kegs, f.o.b. York, Pa., per lb. Under 100 lb. ....	\$2.60 \$3.00
Zirconium, 35-40%, contract basis, carloads in bulk or package, per lb. of alloy .....	15c.
Less-ton lots .....	16c.
Zirconium, 12-15%, contract basis, carlots, bulk, per gross ton.	\$102.50
Packed .....	\$107.50
Less-ton lots .....	\$112.50
Alsifer (approx. 20% Al, 40% Si and 40% Fe), contract basis, f.o.b. Niagara Falls, per lb. ....	7.50c.
Ton lots .....	8c.
Simanal (approx. 20% Si, 20% Mn, 20% Al), contract basis, carlots, freight allowed, per lb.	10.50c.
Less-ton lots .....	11c.



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